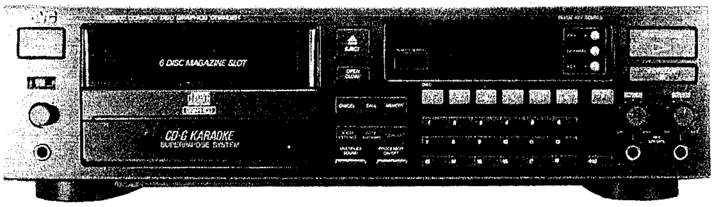
JVC

SERVICE MANUAL

COMPACT DISC GRAPHICS CHANGER

MODEL No. XL-GM800TN



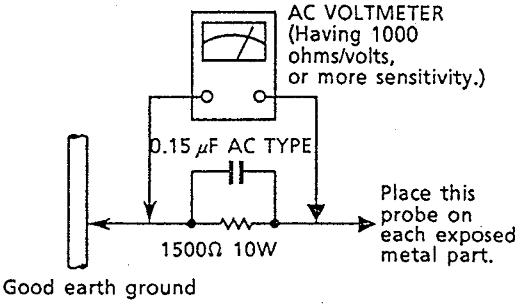
Contents

Safety Precautions 1-2
Important for Laser Products 1-3
Instruction Book 1-4
Description of Major ICs 1-19
Internal Connections of FL Display Tube 1-34
Disassembly Procedures 1-35
Adjustment Procedures 1-38
Maintenance of Laser Pickup 1-40
Replacement of Laser Pickup 1-40
Initial Operation of Mechanism 1-41
Switches' operation 1-43
Flow of Functional Operation Until TOC is Read 1-44
Troubleshooting 1-45
Schematic Diagram .... Insertion
Block Diagram .... Insertion
Printed Circuit Boards .... Insertion
Connection Diagram .... Insertion
Exploded View of Assembliesand Application Points for Grease .... Insertion
Parts List .... Insertion

No.20288
NOV. 1991

Safety Precautions

1. The design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute repalcement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage currnet check (Electrical shock hazard testing)
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, contorl shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.).
   - Alternate check method
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500Ω 10 W resistor paralleled by a 0.15 μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and meausre the AC voltage across the resistor.
     Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.).
     This corresponds to 0.5 mA AC (r.m.s.).


AC VOLTMETER
(Having 1000 ohms/volts, or more sensitivity.)
0.15 μF AC TYPE
1500Ω 10W
Place this probe on each exposed metal part.
Good earth ground

Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.

Important for Laser Products

1. CLASS 1 LASER PRODUCT
2. DANGER : Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.
3. CAUTION : There are no serviceable parts inside the Laser Unit. Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.
4. CAUTION : The compact disc player uses invisible laser radiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.
5. CAUTION : If safety switches malfunction, the laser is able to function.
6. CAUTION : Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
7. CAUTION : The compact disc player provides a laser diode of wavelength 780-790nm and optical output power typical 3mW at the laser diode.

VARNING : Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

ADVARSEL : Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

ADVARSEL : Usynlig laserstråling ved åpning, når sikkerhetsbryteren er avslott. unngå utsettelse for stråling.

REPRODUCTION AND POSITION OF LABELS

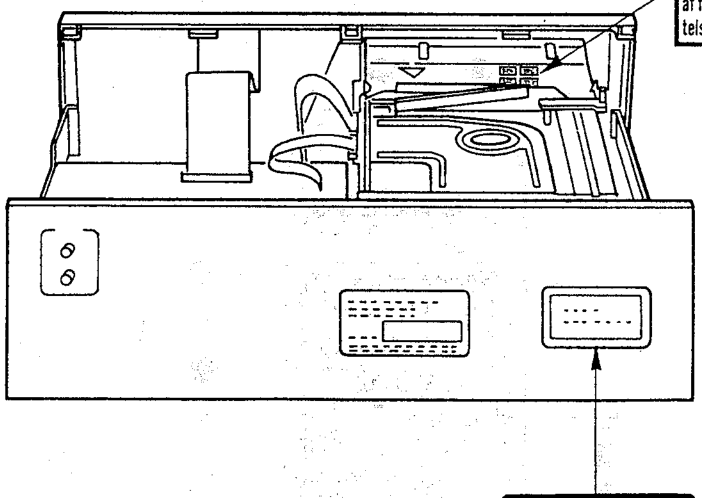
WARNING LABEL
(Except for the U.S.A.)

DANGER: Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM. (e)

VARNING: Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen. (s)

ADVARSEL : Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling. (d)

VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen. (f)

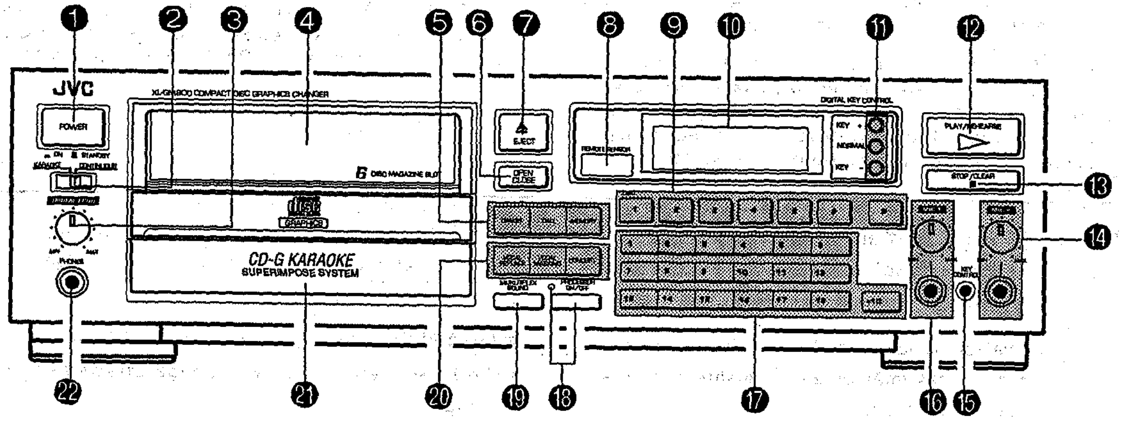


CLASS 1
LASER PRODUCT

CLASSIFICATION LABEL
(Except for the U.S.A. and Canada)

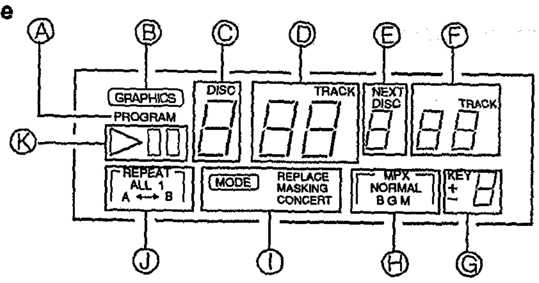
NAMES AND FUNCTIONS/NOMS ET FONCTION

FRONT PANEL/PANNEAU AVANT

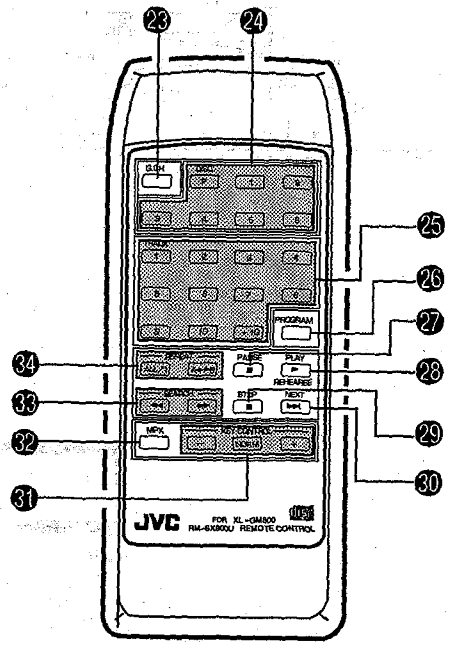

①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
㉒
JVC
POWER
XL-GM800 COMPACT DISC GRAPHICS CHANGER
EJECT
OPEN CLOSE
REMOTE SENSOR
DIGITAL KEY CONTROL
KEY +
NORMAL
KEY -
PLAY/REHEARSE
STOP/CLEAR
6 DISC MAGAZINE SLOT
GRAPHICS
CD-G KARAOKE
SUPERIMPOSE SYSTEM
PHONES
KEY CONTROL

⑩ Display window

⑩ Fenêtre d'affichage


Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ
Ⓕ
Ⓚ
GRAPHICS
PROGRAM
DISC
TRACK
NEXT DISC
TRACK
REPEAT
ALL 1
A ←→ B
MODE
REPLACE
MASKING
CONCERT
MPX
NORMAL
BGM
KEY
+
-
Ⓙ
Ⓘ
Ⓗ
Ⓖ

REMOTE CONTROL UNIT
TELECOMMANDE


㉓
㉔
㉕
㉖
㉗
㉘
㉙
㉚
㉛
㉜
㉝
㉞
PROGRAM
PAUSE
PLAY
REHEARSE
STOP
NEXT
MPX
KEY CONTROL
NORM
JVC
FOR XL-GM800
RM-SX800U REMOTE CONTROL

We would like to thank you for purchasing one of our JVC products.
Before connecting this unit to the wall outlet, please read the instructions carefully to ensure that you obtain the best possible performance.
If you have any question, please consult your JVC dealer.

CONTENTS

PRECAUTIONS 1
HOW TO HANDLE A COMPACT DISC 2
BEFORE USING FOR THE FIRST TIME 3
REMOTE CONTROL UNIT BATTERY INSERTION 4
CONNECTIONS 5
NAMES AND FUNCTIONS 7
KARAOKE PLAY 9
DISC PLAY (CONTINUOUS PLAY) 12
TROUBLESHOOTING 14
SPECIFICATIONS 14

PRECAUTIONS

Installation

- Select a location which is level, dry and neither too cold nor too hot (temperature range 5°C (41°F) to 35°C (95°F).
- Avoid dusty locations or any location subject to vibration.

Power

- When unplugging from the wall socket, always pull the plug body, never the power cable.

Preventing malfunctions

- Never insert anything other than a compact disc into any part of the player.
- Placing anything other than a compact disc on the disc tray may cause the player to malfunction.
- If something goes wrong, turn the power off immediately. If the same problem reoccurs when the power is turned on once more, turn the power off again and consult your JVC dealer.

Volume settings

A CD player has almost zero background noise. The technique of listening to the background level and then setting volume before the music starts, as used with analog turn tables or tape decks, cannot be used. If you raise the volume level too high, speaker damage may result.

Condensation

The CD player uses optical components. If it is moved from a cold location to a warm one, or is used in a room subject to excessive humidity or where a fire has just been lit, condensation could form on the optical components.
This may prevent the laser beam from being properly received and thus cause noise or even a malfunction.
If condensation has formed and the CD player does not function correctly, we recommend that you leave it turned on for an hour or two. If at the end of this time the CD player still does not function properly, please consult your JVC dealer.

Note:

- When this equipment is placed near either a tuner or a radio receiver tuned to AM frequencies, interference may occur. If this has happened, we recommend either that you move this unit as far away as possible from the tuner or receiver or briefly turn off the power to this unit.
- When carrying this unit, it is best to avoid either tilting it or turning it upside-down. Where you cannot avoid doing so, please remove the magazine first.

COMPACT
disc
DIGITAL AUDIO

Only use compact discs bearing this mark.

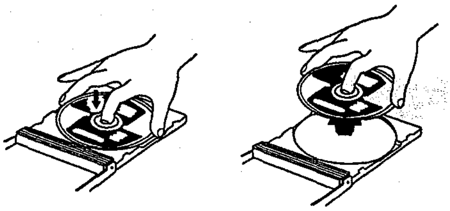
CD GRAPHICS

GRAPHICS

This machine has a CD subcode graphics decorder.
It can reproduce images stored on CDs bearing the mark above on their surface.
CD graphics is a system that reproduces still image video signals by using vacant signal areas, called subcodes, in addition to audio signals. By connecting the XL-GM800TN to an amplifier and a *TV monitor, you can enjoy graphic images, such as pictures and characters.
This is deal for singing songs to prerecorded accompaniment, taking lessons in musical instruments, and so on.
*(NTSC system)

HOW TO HANDLE A COMPACT DISC

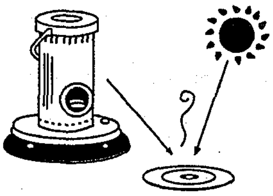
How to handle CDs



When handling compact discs, do not touch the surface of the disc (reflective silver side - the side without the label).

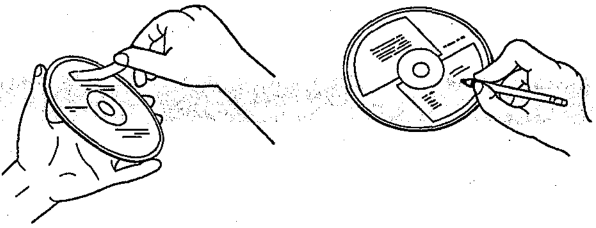
Since compact discs are made of plastic, they are easily damaged. If the disc gets dirty, dusty, scratched or warped, the sound will not be picked up correctly and, in addition, such discs may cause the CD player to malfunction.

Storage

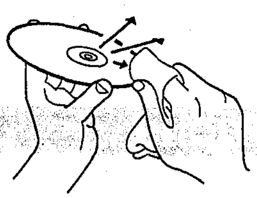


Make sure that discs are kept in their cases. If discs are piled one on top of another without their protective cases, they can be damaged.
Do not put discs in any location where they can be exposed to direct sunlight - or in any place where humidity or temperature is high. Avoid leaving discs in your car!

Maintenance of discs



- Do not damage the label side, stick paper to or use any adhesive on this surface.



- When there are fingerprints or other dirt adhering to a disc, wipe the disc with a soft, dry cloth with a movement going from the inside outwards.
- If difficult to clean, wipe the disc with a cloth moistened with water.
- Never use record cleaners, petrol, alcohol or any anti-static agents.

Recommendations for handling the magazine

1. Always keep the magazine loaded with its six disc trays.
2. When removing or inserting disc trays, the magazine should be held horizontal.
3. Never load a disc directly into the magazine without a disc tray.
4. Do not expose it to high temperatures or to direct sunlight.
5. Do not dismantle the magazine.
6. Take care not to drop or hit the magazine. Do not apply any pressure to the disc trays, particularly when removed from the magazine.
7. Never apply solvents such as petrol, thinner or insecticide to the surfaces of the magazine or the disc trays. Such solvents may damage their surfaces.
8. If you wish to use 8 cm (3") CD's please obtain the special magazine (XC-M73) designed for these.

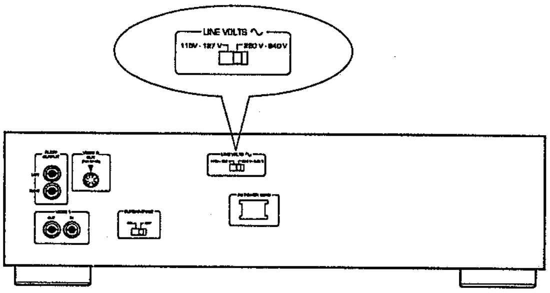
BEFORE USING FOR THE FIRST TIME

CHECKING YOUR MAINS VOLTAGE (Except for the U.S.A., Canada, Australia, U.K. and Continental Europe)

Before you insert the power plug into the wall socket, please check the line voltage (mains voltage) setting to ensure that it corresponds with the mains voltage in your area. If it is not correctly set, please adjust the voltage selector switch to the proper setting before you start operating this equipment. The voltage selector switch is located on the rear panel.

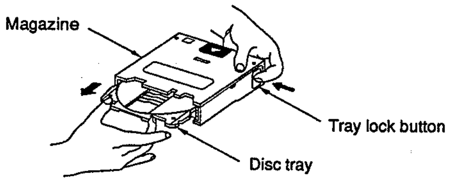
CAUTION

- Before adjusting the voltage selector switch please remove the power plug from the power socket.

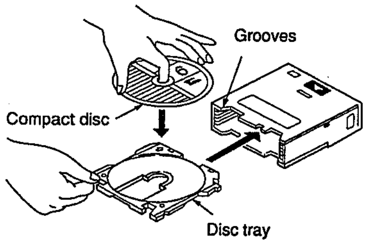


-How to install discs in the 6-disc magazine.

1. The disc trays in the magazine are removable.
   Slide the disc tray out while simultaneously pressing the tray lock button.



2. Place a disc on the disc tray with its label side up.

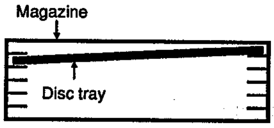


3. Line up the disc tray with the grooves in the magazine and push the disc tray in. It is unnecessary to press the tray lock button when inserting the disc tray.

- If you wish to use 8 cm (3") CDs, please obtain the special magazine (XC-M73) designed for these.
- If you wish to use 12 cm (5") CDs, please obtain the special magazine (XC-M75) designed for these.

Please note:

- Never bend the disc tray or force it into the magazine.
  A disc tray which is inserted skewed may cause a malfunction.

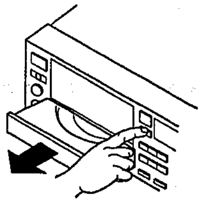


Do not insert skewed

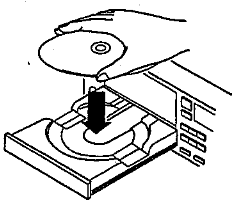
- The openings in the disc trays are for passage of the laser signal. These openings leave part of the shiny surface of the disc exposed. Please take care not to touch this shiny surface.
- It is not possible to play a disc if it is inserted upside-down.
- Never place a disc directly in the magazine without using the disc tray.

-How to load a disc on the plus-1 tray.

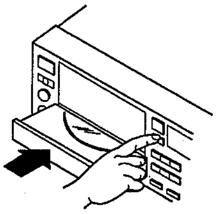
1. Press the OPEN/CLOSE button



2. Place a disc on the disc tray with its label side up.



3. Press the OPEN/CLOSE button.



REMOTE CONTROL UNIT BATTERY INSERTION

Installing batteries in the remote control unit

The remote control unit provided with the player requires two size AAA (1.5 V) batteries.

-Battery replacement

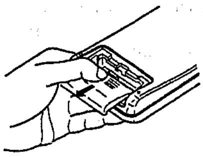
Service life of batteries depends on the condition of use; standard life is about one year. When the batteries become weak, the operating distance of the remote control unit will be reduced. If this happens, replace the batteries with new ones.

Note:

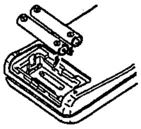
- The lower the temperature, the shorter the battery life.

-How to install batteries

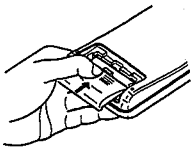
1. Remove the rear cover of the remote control unit by pressing down and simultaneously pulling it backwards.



2. Install batteries (UM-4, AAA, R03). Be sure batteries are installed with correct polarity, (+) and (–).



3. Slide the rear cover back into position.



Please note:

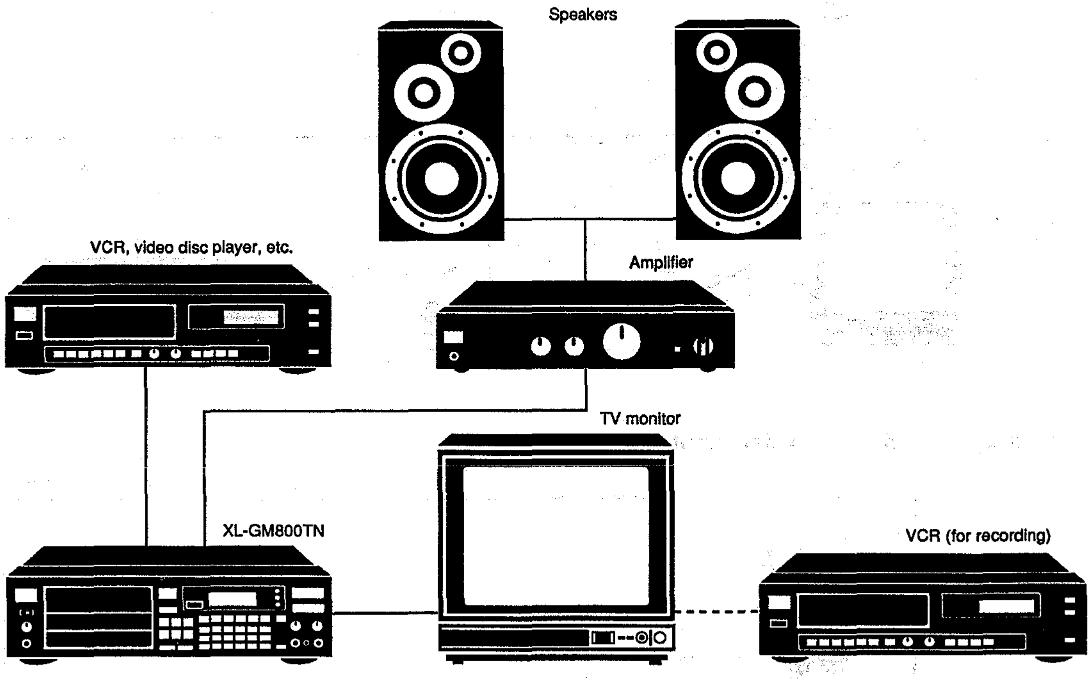
- Incorrect use of batteries can cause corrosion or damage. Note the following points to lengthen battery life.

1. Install batteries observing the correct polarity, (+) and (–).
2. Do not use new and old batteries simultaneously.
3. Batteries with similar shapes may have different voltage ratings. Be sure to use the correct batteries.
4. Remove batteries from the remote control unit if it will not be used for a long period of time.

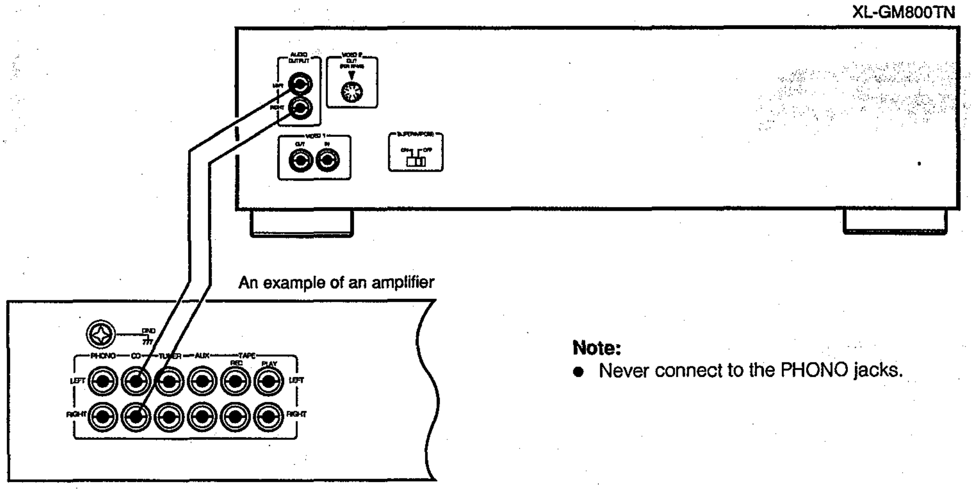
CONNECTIONS

CONNECTION DIAGRAM

- Do not connect the power plug until all connections are completed.
- Connect the plugs firmly.
- Refer to the amplifier's Instruction manual when connecting the VIDEO terminal to an amplifier equipped with video terminal.


Speakers
VCR, video disc player, etc.
Amplifier
TV monitor
XL-GM800TN
VCR (for recording)

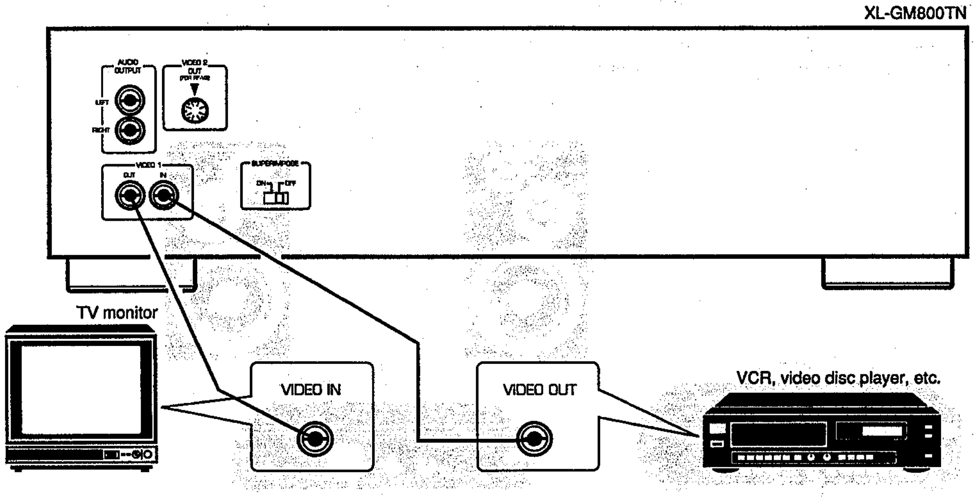
Connecting the AUDIO OUTPUT jacks


XL-GM800TN
AUDIO OUTPUT
LEFT
RIGHT
VIDEO 1
OUT
IN
SUPERIMPOSE
ON
OFF
An example of an amplifier
GND
PHONO
CD
TUNER
AUX
TAPE
REC
PLAY
LEFT
RIGHT

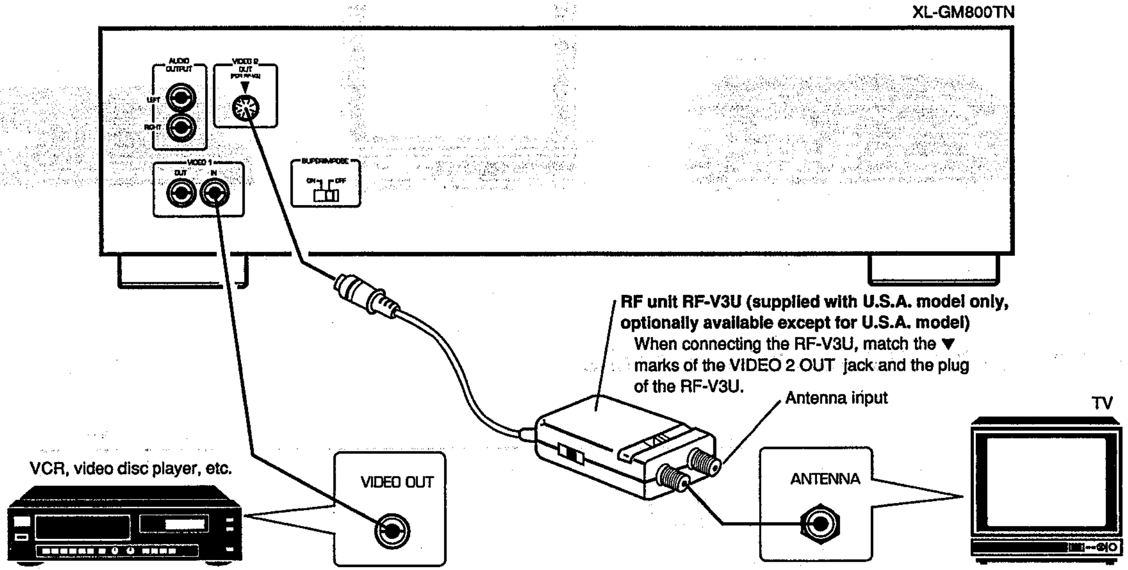
Note:
- Never connect to the PHONO jacks.

Connecting the VIDEO jacks

● When using a TV monitor which has a video input jack


XL-GM800TN
AUDIO OUTPUT
LEFT
RIGHT
VIDEO 2 OUT
VIDEO 1
OUT
IN
SUPERIMPOSE
ON
OFF
TV monitor
VIDEO IN
VIDEO OUT
VCR, video disc player, etc.

● When using a TV without a video input jack

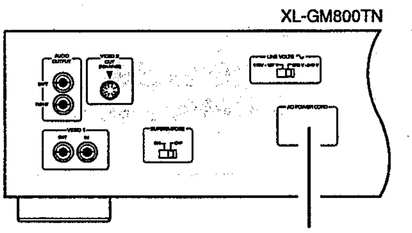

XL-GM800TN
AUDIO OUTPUT
LEFT
RIGHT
VIDEO 2 OUT
VIDEO 1
OUT
IN
SUPERIMPOSE
ON
OFF
VCR, video disc player, etc.
VIDEO OUT
Antenna input
ANTENNA
TV

RF unit RF-V3U (supplied with U.S.A. model only, optionally available except for U.S.A. model)
When connecting the RF-V3U, match the ▼ marks of the VIDEO 2 OUT jack and the plug of the RF-V3U.

- Set the video/TV selector to the video position.
- When watching a TV broadcast, turn off the power of the XL-GM800TN.

Connecting the power cord

The AC power cord is supplied separately. Connect the power plug after all connections are completed.



Connect the power cord to this power inlet.

NAMES AND FUNCTIONS

FRONT PANEL

❶ **POWER (▬ ON/■ STAND BY) switch**

Press this switch to turn the power on. Press again to turn the power off and activate the STANDBY mode.
A small amount of power (5 watts) is consumed in the STANDBY mode. To turn the power off completely, disconnect the power cord from the wall outlet.

❷ **KARAOKE/ CONTINUOUS selector**

Used to select KARAOKE mode or CONTINUOUS mode.

❸ **DIGITAL ECHO control**

To increase the microphone echo level, turn this control to the right. To decrease it, turn this control to the left. This affects only the voice of the singer, not the sound of the CD.

❹ **6-DISC MAGAZINE SLOT**

Insert the 6-disc magazine into this slot.

❺ **Program buttons**

CANCEL: Press to erase a program.
CALL: Each time this button is pressed, the programmed contents are displayed in the programmed order.
MEMORY: Press to enter the program mode.

❻ **OPEN/CLOSE button**

Press to open or close the plus-1 tray.

❼ **EJECT (⏏) button**

Press to eject the 6-disc magazine.

❽ **REMOTE SENSOR**

Receives the signal from the supplied remote control unit.

❾ **DISC buttons**

1-6: Press to select a disc loaded in the 6-disc magazine.
P: Press to specify the disc loaded in the plus-1 tray.

❿ **Display window**

⓫ **DIGITAL KEY CONTROL buttons**

Press the +KEY button to heighten the musical pitch and the –KEY button to lower the pitch . The musical pitch can be changed up to ±8 steps (± 2 notes). To return to the normal pitch, press the NORMAL button.

⓬ **PLAY/ REHEARSE (▷) button**

Press to play a disc in the 6-disc magazine or return to the beginning of the track being played.

⓭ **STOP/CLEAR (■) button**

Press to stop play. When this button is pressed during stop mode, all of the program contents are cleared.

⓮ **MIC 2 level control and MIC 2 jack**

Connect a microphone to the MIC 2 jack.
To adjust the microphone level, use the MIC 2 level control. Turning this control to the right increases the level while turning it to the left decreases the level.

⓯ **KEY CONTROL jack**

Connect the optional key control unit CN-238 to this jack. With the CN-238, the pitch of your voice can be changed.

⓰ **MIC 1 level control and MIC 1 jack**

Connect a microphone to the MIC 1 jack.
To adjust the microphone level, use the MIC 1 level control. Turning this control to the right increases the level while turning it to the left decreases the level.

⓱ **Track number buttons**

Press to specify track numbers. When the desired track number is 18 or less, use the [1] - [18] buttons. To specify a track number greater than 18, use the [+10] button and the [1]-[18] buttons.

⓲ **PROCESSOR ON/OFF button and indicator**

When the KARAOKE/CONTINUOUS selector is set to the KARAOKE position, this button is automatically turned on (the indicator lights) and the built-in digital sound processor (VOCAL REPLACE, VOCAL MASKING, CONCERT, DIGITAL KEY CONTROL, DIGITAL ECHO, etc.) can be activated. When it is not necessary to use the digital sound processor functions, press this button so that the indicator goes off.

⓳ **MULTIPLEX SOUND button**

In the vocal replace mode, you can select the normal play (vocal + background music) or only the background music. Each time this button is pressed, the mode changes between NORMAL and BGM.

⓴ **VOCAL REPLACE, VOCAL MASKING and CONCERT buttons**

When the PROCESSOR ON/OFF button ⓲ is set to the ON position (the indicator lights), you can select the desired mode with the following buttons.
VOCAL REPLACE: To replace the original vocals with your voice when you sing, press this button so that the REPLACE indicator lights. To cancel the vocal replace function, press this button again. For this function, use sound multiplexeddiscs.
VOCAL MASKING: To reduce the level of the original vocals so that the background music is mainly heard, press this button so that the MASKING indicator lights. To cancel the vocal masking function, press this button again.
CONCERT: To obtain an atmosphere of playing in a concert hall, press this button so that the CONCERT indicator lights. Echo and reverberation sounds of the background music are relatively long.

㉑ **Plus -1 tray**

Load a disc to be played. To open and close the tray, press the OPEN/ CLOSE button.

㉒ **PHONES jack**

Insert the headphones plug into this jack for private listening.

❿Display window

Ⓐ **PROGRAM indicator**

Lights up while programming. In the disc play (continuous) mode, this indicator also lights during program playback.

Ⓑ **GRAPHICS indicator**

Lights up when a CD graphics disc is loaded.

Ⓒ **DISC number indicator**

With the 6-disc magazine, the selected disc number is displayed. "P" appears on the display when operating the disc loaded in the plus-1 tray.

Ⓓ **TRACK number indicator**

The selected track number is displayed.

NAMES AND FUNCTIONS

Ⓔ **NEXT DISC indicator**
With the 6-disc magazine, the disc number to be played next is displayed.

Ⓕ **NEXT TRACK indicator**
The track number to be played next is displayed.

Ⓖ **KEY PITCH display**
Displays the key pitch from –8 steps to +8 steps.

Ⓗ **MPX NORMAL/BGM indicators**
Indicate the NORMAL or BGM mode.

Ⓘ **MODE REPLACE/MASKING/CONCERT indicators**
Indicate the REPLACE/MASKING/CONCERT mode.

Ⓙ **REPEAT ALL /1/A↔B indicators**
ALL: Lights during all disc/track repeat mode. This function is not available in Karaoke mode.
1:Lights during single repeat mode.
A↔B: Lights during A↔B repeat mode.

Ⓚ **PLAY/PAUSE indicators**
►: Lights up during play.
❚❚ : Lights up in pause mode.

REMOTE CONTROL UNIT

How to operate

Point the remote control unit towards the REMOTE SENSOR on the front panel of the player, always operating it steadily and carefully. The remote control unit can be used within a range of about 7 meters (23 feet) from the REMOTE SENSOR, and within angles of up to about 30 degrees.

㉓ **G. CH (graphics channel) button**
Each time this button is pressed, the CD graphics channel is changed (1 - 15). When the desired channel appears on the display, press this key again within 4 seconds to select the displayed channel.

㉔ **DISC number buttons**
These buttons have the same functions as the buttons on the front panel.

㉕ **TRACK number buttons**
Used to select the desired track number. To specify track number 11 or above, use the [+10] button.

㉖ **MEMORY button**
This button has the same function as the MEMORY button on the front panel.

㉗ **PAUSE (❚❚) button**
Press to stop play temporarily. To resume play, press the PLAY/REHEARSE ▻ button.

㉘ **PLAY (►) button**
This button has the same function as the PLAY/REHEARSE ▻ button on the front panel.

㉙ **STOP (■) button**
Press to stop play.

㉚ **NEXT (►►|) button**
Press to skip to the next track.

㉛ **KEY CONTROL buttons**
These buttons have the same functions as the DIGITAL KEY CONTROL buttons on the front panel.

㉜ **MPX button**
This button has the same function as the MULTIPLEX SOUND button on the front panel.

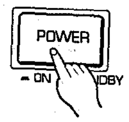
㉝ **SEARCH ◄◄ and ►► buttons**
While the ◄◄ button is kept pressed, play rapidly reverses toward the beginning of the disc. While the ►► is kept pressed, play rapidly advances toward the end of the disc. When the desired portion is reached, release the ◄◄ or ►► button. The player enters the original mode (play or pause).

㉞ **REPEAT ALL/1 and A↔B buttons**
ALL/1: In disc play (continuous) mode, each time this button is pressed, the repeat mode changes in the following order: ALL (all disc/track repeat) → 1 (single track repeat) → off. In all repeat mode, all discs in the magazine and/or all tracks on the disc loaded in the plus-1 tray are played repeatedly (not available in Karaoke mode). In single track repeat mode, the track number being displayed is played repeatedly.
A↔B: Press this button when the start point of the section to be repeated is reached. When the end point of the section to be repeated is reached, press this button again. The specified section is played repeatedly. To cancel the A↔B repeat mode, press this button again.

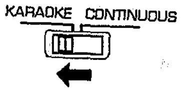
KARAOKE PLAY

Preliminary Operation

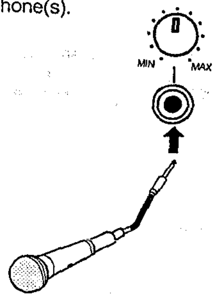
1. Press the POWER switch to turn on the player.



2. Set the KARAOKE/CONTINUOUS selector to KARAOKE.



3. Connect microphone(s) to the MIC1 or MIC2 jack and turn on the microphone(s).

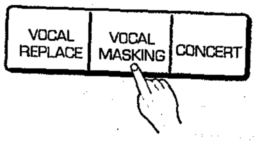


4. Insert a magazine, with discs installed, into the 6-DISC MAGAZINE SLOT and push it gently until it clicks into place. In addition, you can load a disc in the Plus-1 tray. Refer to "How to install discs in the 6-disc magazine" and "How to load a disc on the plus-1 tray" on page 3.

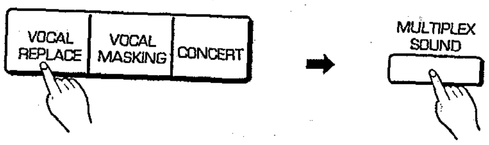
Basic Operation

1. Select the desired Karaoke mode.

To reduce the level of the original vocals:
Press the VOCAL MASKING button so that the MASKING indicator lights. Even when playing a general stereo disc, the background music is mainly heard and the level of the original vocals is reduced.



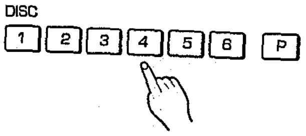
To replace the original vocals with your voice when you sing:
Press the VOCAL REPLACE button so that the REPLACE indicator lights and press the MULTIPLEX SOUND button so that the NORMAL indicator lights. When you sing into the microphone, your voice replaces the original vocals.



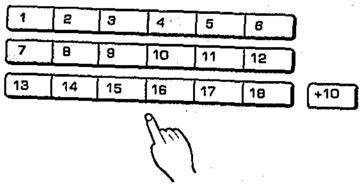
When you want to remove the original vocals completely:
Press the MULTIPLEX SOUND button so that the BGM indicator lights after setting the VOCAL REPLACE button.

- Make sure that the PROCESSOR ON/OFF button is set to ON.
- The vocal replace function can be carried out with sound multiplexed discs only.

2. Select a disc which contains the desired track.
With the 6-disc magazine, press the DISC number button which contains the track to be played. With the plus-1 tray, press the P button.

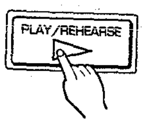


3. Press the desired track number.



When selecting track number 19 or above, use the [+10] button.
Example: To select track number 19, press [+10] and then [9].
To select track number 25, press [+10] twice and then [5].
To select track number 30, press [+10] twice and then [10].
With the TRACK number buttons on the remote control unit, use the [+10] button when selecting track number 11 or above.

4. Press the PLAY/REHEARSE ▷ button to start play.



The player enters stop mode when a track finishes playing. To resume playback of the same track, press the PLAY/REHEARSE ▷ button.

5. Sing into the microphone and adjust the microphone level with the MIC 1 or MIC 2 level control.

To search for a desired section during play or in pause mode
Use the SEARCH ◄◄ or ►► button on the remote control unit. While the SEARCH ◄◄ button is kept pressed, play rapidly reverses toward the beginning of the disc. While the SEARCH ►► button is kept pressed, play rapidly advances toward the end of the disc. When the desired section is reached, release the button. The player enters the original mode (play or pause).

To stop play temporarily
Press the PAUSE ❚❚ button on the remote control unit. To resume play, press the PLAY ► button on the remote control unit or the PLAY/REHEARSE ▷ button on the front panel.

To stop play
Press the STOP/CLEAR ■ button or the STOP ■ button on the remote control unit.

To remove the disc from the plus-1 tray
Press the OPEN/CLOSE button and remove the disc. Press the OPEN/CLOSE button to close the tray.

To eject the magazine
Press the EJECT ≜ button and remove the magazine.

Various Functions for Karaoke Play

- Make sure that the PROCESSOR ON/OFF button is set to ON. (The indicator lights.)

To adjust the microphone echo

The microphone echo is increased by turning the DIGITAL ECHO control to the right and decreased by turning the control to the left.

To obtain an atmosphere of playing in a concert hall

Press the CONCERT button. The CONCERT indicator lights and the echo and reverberation sounds of the background music are relatively long. To cancel the concert function, press the CONCERT button again.

Note:

This function has no effect on your voice.

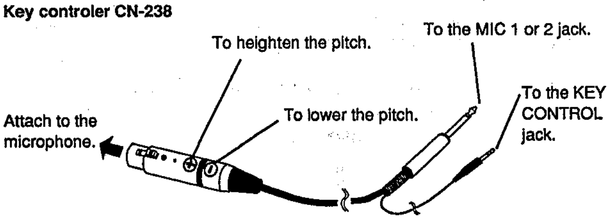
To change the musical pitch

Press the DIGITAL KEY CONTROL +KEY button to heighten the musical pitch or the –KEY button to lower the pitch . The musical pitch can be changed up to ±8 steps (±2 notes) and the display shows the selected step. To return to the normal pitch, press the NORMAL button. After playing one track, the setting is reset to the normal position.

To change the musical pitch at your singing position:

The optional key controller CN-238 also allows you to control the musical pitch. Connect the CN-238 to the KEY CONTROL jack on the front panel and attach the CN-238 to the microphone. You can control the musical pitch at your singing position. The musical pitch can be changed up to ± 8 steps (±2 notes) and the display shows the selected step. Refer to the instruction manual supplied with the CN-238.

Key controler CN-238



Repeat Play

With the REPEAT ALL/1 button or REPEAT A↔B button, you can select single track repeat mode or section repeat mode.

Single track repeat

Press the REPEAT ALL/1 button on the remote control unit. The REPEAT 1 indicator lights and the track number being displayed is played repeatedly. To cancel single track repeat mode, press the REPEAT ALL/1 button again.

Section repeat

Press the REPEAT A↔B button when the beginning of the section to be repeated is reached. When the end of the section to be repeated is reached, press the REPEAT A↔B button again. The specified section is played repeatedly. To cancel section repeat mode, press the A↔B button again.

Note:

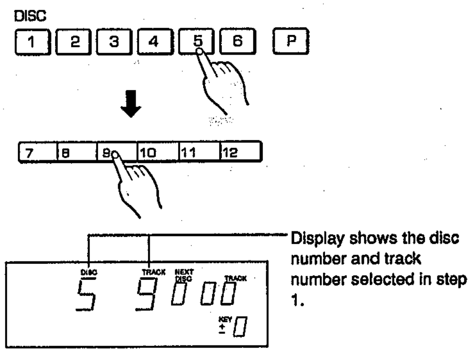
If the NEXT, REPEAT ALL/1 or CANCEL button is operated, the section repeat mode is also canceled.

Programming the Desired Tracks

You can program up to 32 tracks in any desired order among the discs in the magazine and plus-1 tray.

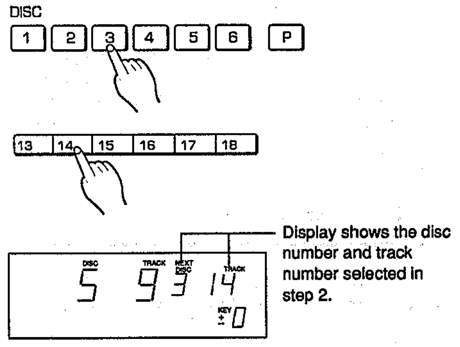
Example: To program track number 9 on disc number 5 and track number 14 on disc number 3 in this order.

1. In stop mode, press the DISC number 5 button and then the track number 9 button.



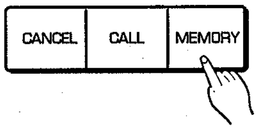
Display shows the disc number and track number selected in step 1.

2. Press the DISC number 3 button and then the track number 14 button.



Display shows the disc number and track number selected in step 2.

3. Press the MEMORY button to complete the programming.



To check the program contents

Each time the CALL button is pressed, the program contents are displayed in the programmed order.

To delete a programmed track

Press the CALL button until the display shows the program step to be deleted and then press the CANCEL button.

To clear the entire program

Press STOP/CLEAR ■ button in stop mode.

- If the magazine is ejected or the plus-1 tray is opened, the program contents will be cleared.

To play programmed tracks

Press the PLAY/REHEARSE ⊳ button. The first track in the program is searched for and played and the player enters pause mode at the beginning of the next programmed track. To enter play mode, press the PLAY/REHEARSE ⊳ button.

- The programmed track which has been played is deleted from the program contents.
- You can select the desired programmed track with the NEXT button on the remote control unit. However, the track skipped with the NEXT button is deleted from the program contents.

To Play a CD Graphics disc

1. Turn on the power of the TV monitor.
2. Play a CD graphics disc. The GRAPHIC indicator lights and an image stored on the CD is reproduced.
3. Press the G.CH button on the remote control unit to select the channel number you want to view. Each time the G. CH button is pressed, the channel number increases up to channel 15 and then returns to channel number 1. If the CD has no channel number, select channel 1.
   When the disc is changed or the player enters stop mode, the channel number returns to channel 1.

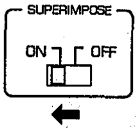
Notes:

- The reproduced images may appear to be slightly shifted vertically or horizontally, depending on the type of monitor used.
- Different types of monitors may produce some differences in the image brightness and tones.
- Images stored on CDs or their color might appear distorted, depending on their characteristics or the type of monitor used. In these cases, the distortion can be alleviated by slightly dimming the monitor brightness.
- You cannot always arrange the display with a video processor or record it with a VCR.
- Performing a search operation or pausing while displaying a picture could disturb the picture on the screen.

Superimpose Function

You can superimpose CD graphics images and lyrics on the picture from a VCR, video disc player, etc.

1. Turn on the power of the TV monitor and set the SUPERIMPOSE selector on the rear panel to ON .



2. Play a CD graphics disc. Refer to "Basic Operation" on page 12.
3. Set the VCR or video disc player to playback mode. The contents of the CD graphics are superimposed.
   To cancel the superimpose function, set the SUPERIMPOSE selector of the rear panel to OFF.

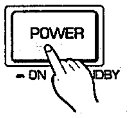
Notes:

- The superimpose function can be carried out when using JVC CD graphics.
- The screen will sometimes fluctuate depending on the connected video equipment or video source.
- If the CD graphics are superimposed on the picture of a damaged video tape or dubbed tape, uneven colors will sometimes occur or the picture will fluctuate.
- When using a VCR which cannot operate the muting function during fast forwarding and stop mode, the screen will fluctuate or characters will not display correctly.
- When snow video signal is input, the screen will fluctuate.
- When you are not using the superimpose function, turn off the power of the TV, VCR, video disc player, etc.
- To enjoy clear characters and pictures when using the superimpose function, the brightness of the input video signal is set to the low position.
- When the connected VCR, video disc player, etc. is not being used, turn off the power of the corresponding component.

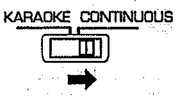
DISC PLAY (CONTINUOUS PLAY)

Preliminary Operation

1. Press the POWER switch to turn on the player.



2. Set the KARAOKE/CONTINUOUS selector to CONTINUOUS.



3. Insert a magazine, with discs installed, into the 6 -DISC MAGAZINE SLOT and push it gently until it clicks into place. In addition, you can load a disc in the plus-1 tray. Refer to "How to install discs in the 6-disc magazine" and "How to load a disc on the plus-1 tray" on page 3.

Continuous Playback

To start playback

Press the PLAY/REHEARSE ▷ button.

PLAY/REHEARSE

In Continuous mode, you may continuously play any track on any disc through the final track on DISC number 6. When the 6-disc magazine inserted into the player and a disc is loaded in the plus-1 tray, the player starts playback from the first track on the disc loaded in the plus-1 tray and all tracks on the disc are played. Playback is continued from the first track on DISC number 1 in the magazine and the player enters stop mode after the final track on DISC number 6 is played.

To search for a desired section during play or in pause mode

Use the SEARCH ◀◀ or ▶▶ button on the remote control unit. While the SEARCH ◀◀ button is kept pressed, play rapidly reverses toward the beginning of the disc. While the SEARCH ▶▶ button is kept pressed, play rapidly advances toward the end of the disc. When the desired section is reached, release the button. The player enters the original mode (play or pause).

To skip to the next track

Press the NEXT ▶▶| button on the remote control unit.

To return to the beginning of the track being played

Press the PLAY/REHEARSE ▷ button.

To stop play temporarily

Press the PAUSE ▮▮ button on the remote control unit. To resume play, press the PLAY/REHEARSE ▷ button.

To stop play

Press the STOP/CLEAR ■ button.

To remove the disc from the plus-1 tray

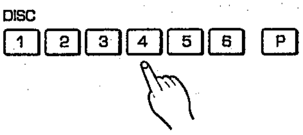
Press the OPEN/CLOSE button and remove the disc. Press the OPEN/CLOSE button to close the tray.

To eject the magazine

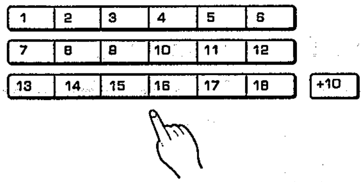
Press the EJECT ▲ button and remove the magazine.

To play from any desired track

1. Select a disc which contains the desired track.
   With the 6-disc magazine, press the DISC number button which contains the track to be played. With the plus-1 tray, press the P button.



2. Press the desired track number.



When selecting track number 19 or above, use the [+10] button.
Example: To select track number 19, press [+10] and then [9].
To select track number 25, press [+10] twice and then [5].
To select track number 30, press [+10] twice and then [10].
With the TRACK number buttons on the remote control unit, use the [+10] button when selecting track number 11 or above.

Digital sound processor function

To obtain an atmosphere of playing in a concert hall, use the built-in digital sound processor. Set the PROCESSOR ON/OFF button to ON and press the CONCERT button. Echo and reverberation sounds are relatively long. To cancel this function, set the PROCESSOR ON/OFF button to OFF.

Repeat Play

With the REPEAT ALL/1 button or REPEAT A⟷B button on the remote control unit, you can select the all discs repeat mode, single track repeat mode or section repeat mode.

All discs repeat

Press the REPEAT ALL/1 button on the remote control unit so that the REPEAT ALL indicator lights. All tracks on all discs in the player are played repeatedly. When the 6-disc magazine is inserted into the player and a disc is loaded in the plus-1 tray, repeat playback continues in the following order, plus-1 tray → magazine → plus-1 tray. To cancel the all repeat mode, press the REPEAT ALL/1 button until the REPEAT indicator goes off.

Single track repeat

Press the REPEAT ALL/1 button on the remote control unit so that the REPEAT 1 indicator lights. The track number being displayed is played repeatedly. To cancel the single track repeat mode, press the REPEAT ALL/1 button again.

Section repeat

Press the REPEAT A⟷B button when the beginning of the section to be repeated is reached. When the end of the section to be repeated is reached, press the REPEAT A⟷B button again. The specified section is played repeatedly. To cancel the section repeat mode, press the A⟷B button again.

Note:

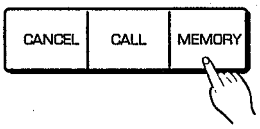
The section repeat mode is also canceled if the NEXT, SEARCH, REPEAT ALL/1, DISC number, track number or CANCEL button is operated.

Programming the Desired Tracks

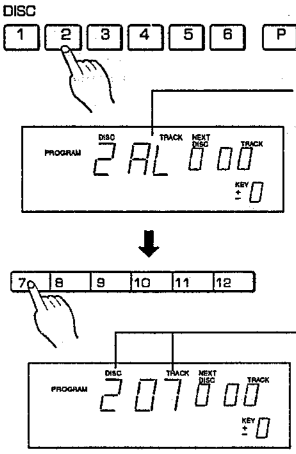
You can program up to 32 steps in any desired order among the discs in the magazine and plus-1 tray.

Example: To program track number 7 on disc number 2 and track number 11 on disc number 4 in this order.

1. In stop mode, press the MEMORY button. The PROGRAM indicator lights.


CANCEL
CALL
MEMORY

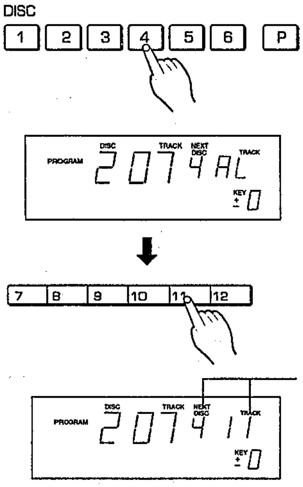
2. Press the DISC number 2 button and then the track number 7 button.


DISC
1
2
3
4
5
6
P
PROGRAM
DISC
TRACK
NEXT DISC
TRACK
2 AL 0 00
KEY ±0
7
8
9
10
11
12
PROGRAM
DISC
TRACK
NEXT DISC
TRACK
2 07 0 00
KEY ±0

"AL" indicates all tracks on the disc. To program the entire disc, it is not necessary to specify the track numbers.

Display shows the disc number and track number programmed in step 1.

2. Press the DISC number 4 button and then the track number 11 button.


DISC
1
2
3
4
5
6
P
PROGRAM
DISC
TRACK
NEXT DISC
TRACK
2 07 4 AL
KEY ±0
7
8
9
10
11
12
PROGRAM
DISC
TRACK
NEXT DISC
TRACK
2 07 4 11
KEY ±0

Display shows the disc number and track number programmed in step 2.

Notes:

- Be sure to enter the track number while the DISC number display is blinking (for about 8 seconds).
- To enter track number 19 or above, use the [+10] button. Refer to "To play from any desired track" on page 10.

To check the program contents

Each time the CALL button is pressed, the program contents are displayed in the programmed order.

To delete a program step

Press the CALL button until the display shows the program step to be deleted and then press the CANCEL button.

To add a program step

After programming, enter the disc number and/or track number. The selected disc number and/or track number are programmed in the last step.

To clear the entire program

Press the STOP/CLEAR ■ button in stop mode.

Program playback

After programming, press the PLAY/REHEARSE ▷ button. The programmed tracks are played in the programmed order.

To skip to the next track in the program

Press the NEXT ►►I button on the remote control unit.

To exit program playback

Press the MEMORY button. The player enters normal playback mode.

To repeat the entire program

Press the REPEAT ALL/1 button on the remote control unit so that the REPEAT ALL indicator lights. To cancel the all repeat mode, press the REPEAT ALL/1 button so that the REPEAT indicator goes off.

- The single repeat function can also be carried out during program playback.

TROUBLESHOOTING

What appears to be a malfunction may not always be serious. Please go through the following list before requesting service.

Symptom	Possible cause	Remedy
Although the disc is inserted in the CD player, the DISPLAY shows no data.	● Is the disc placed upside down?	● Place the disc on the disc tray with its label side up.
Selections cannot be programmed.	● Is the "PROGRAM" indicator lit ?	● Press the PROGRAM button.
The remote control unit does not function.	● Are the batteries fresh?	● Replace the batteries with new ones.
The sound is intermittent and is harsh to the ear.	● Is the disc dirty? ● Is the disc scratched? ● Is the disc warped?	● Wipe off the disc surface with a soft cloth. ● Replace the disc with a new one. ● Replace the disc with a new one.
No images appear.	● Is the GRAPHICS mode indicator on?	● Check the TV monitor for correct cabling and operation again. ● Check if the CD inserted is made to graphics specifications.
	● Is the TV monitor input selector switch at the proper position?	● Set the TV monitor input selector switch to the proper position.
	● Is the SURPERIMPOSE selector set to ON?	● Set the SUPERIMPOSE selector to OFF.
Uneven colors or streaky patterns on the CRT screen.	● Radio interference from radio transmitters or similar equipment?	● Please check with your dealer.
Vertically fluctuating images.	● Is the TV monitor vertical hold properly set?	● Set the TV monitor vertical hold properly.
Flickering images.	● Is the CD scratched, contaminated, deformed, or otherwise damaged?	● Clean or replace the CD.
Distorted images or uneven colors.	● Is there an electromagnetic source near the TV monitor?	● Place the speaker at the recommended position.

SPECIFICATIONS

CD capacity	: 7 discs
Signal detection system	: Non-contact optical system
Number of channels	: 2 Channels
Frequency response	: 2 Hz - 20 kHz
Dynamic range	: 88 dB
S/N	: 92 dB at digital 0
Channel separation	: 85 dB (1 kHz)
Total harmonic distortion	: 0.05% (1 kHz)
Wow and flutter	: Below the measurable limit
Output level	: 2.0 V rms (full scale)
Number of program steps	: 32 steps

Dimensions	:435 (W) x 127 (H) x 326 (D) mm (17-3/16" x 5" x 12-7/8 ")
Weight	:5.6 kg (12.4lbs)
Accessories	:Magazine .... 1 Remote control unit (RM-SX800U) .... 1 Battery (UM-4 "AAA" R03 (1.5V)) .... 2 RF unit (RF-V3U) (for U.S.A. only) ...... 1 Audio cord (1m/3.28ft.) .... 1 Video cord (1.2m/3.94ft.) 1

- Design and specifications subject to change without notice.

POWER SPECIFICATION

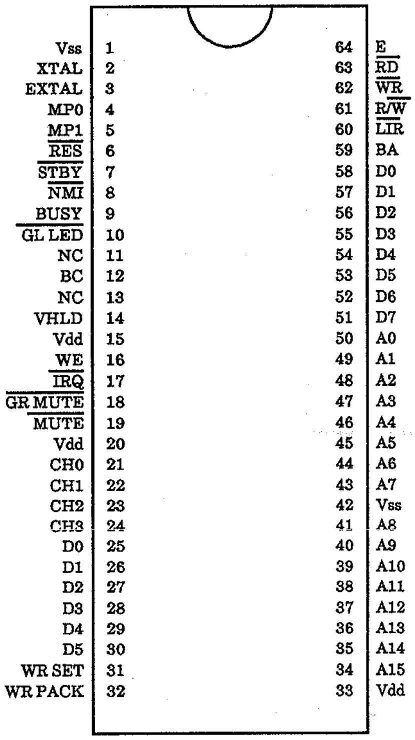
Area	Line Voltage and Frequency	Power Consumption
U.S.A.	AC 120V ∿ 60 Hz	25 Watts
Other Areas	AC 115 - 127/220 - 240 V, 50/60 Hz selectable	25 Watts

Description of Major ICs

■HD63B01Y0RAV3P (IC303)····· Microcomputer

1. Outline : This HD63B01Y0RAV3P is a CPU that carries out De-interleave and error correction.

2. Terminal Layout

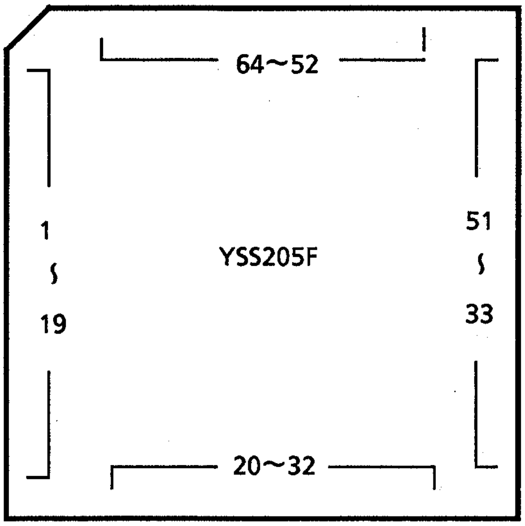

Vss 1 64 E
XTAL 2 63 RD
EXTAL 3 62 WR
MP0 4 61 R/W
MP1 5 60 LIR
RES 6 59 BA
STBY 7 58 D0
NMI 8 57 D1
BUSY 9 56 D2
GL LED 10 55 D3
NC 11 54 D4
BC 12 53 D5
NC 13 52 D6
VHLD 14 51 D7
Vdd 15 50 A0
WE 16 49 A1
IRQ 17 48 A2
GR MUTE 18 47 A3
MUTE 19 46 A4
Vdd 20 45 A5
CH0 21 44 A6
CH1 22 43 A7
CH2 23 42 Vss
CH3 24 41 A8
D0 25 40 A9
D1 26 39 A10
D2 27 38 A11
D3 28 37 A12
D4 29 36 A13
D5 30 35 A14
WR SET 31 34 A15
WR PACK 32 33 Vdd

3. Terminal Function

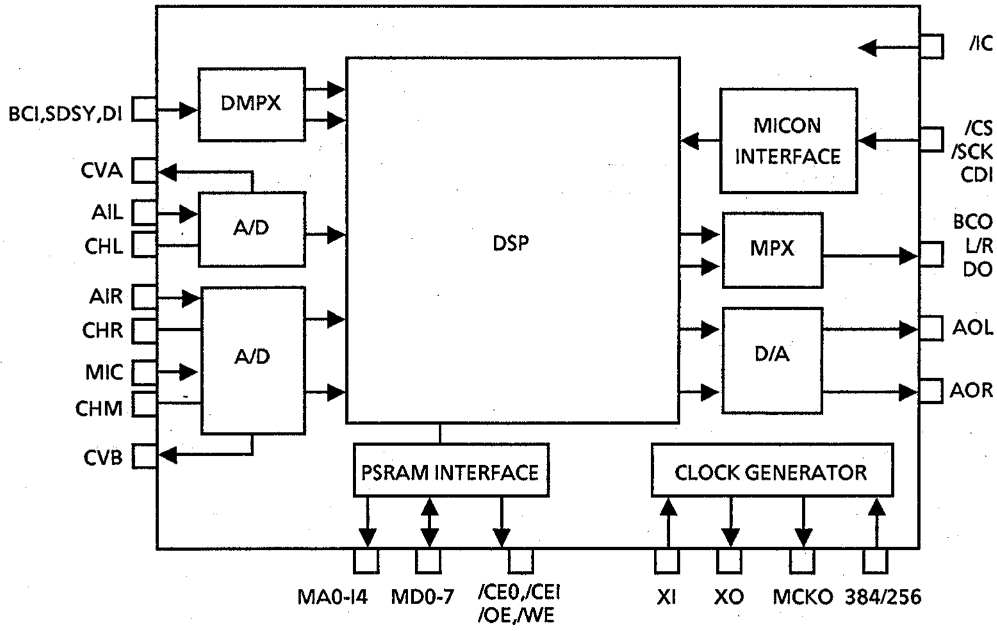
Pin no.	Symbol	I/O	Description	Pin no.	Symbol	I/O	Description
1	Vss	–	Ground Terminal.	19	MUTE	I	Mute signal input.
2	XTAL	O	Not used.	20	Vdd	---	Pull up.
3	EXTAL	I	Clock input.	21~24	CH0~CH3	I	Graphics channel signal input.
4	MP0	I	Select terminal for internal memory and external included memory.	25~30	D0~D5	O	Data output.
5	MP1	I	Select terminal for internal memory and external included memory.	31	SET	I	Write enable signal input.
6	RES	I	Reset signal input.	32	PAC	I	Write enable signal input.
7	STBY	I	Pull up.	33	Vcc	–	+5 power suppry terminal.
8	NMI	I	Pull up.	34~41	A15~A8	O	Address Bus.
9	BUSY	I	Busy signal input.	42	Vss	–	GND.
10	GR LED	O	Graphics IND output.	43~50	A7~A0	O	Address Bus.
11		--	Non connect.	51~58	D7~D0	I	Data intput.
12	BC	O	Block Border Color Fig.	59	BA	O	Not used.
13		--	Non connect.	60	LIR	O	Not used.
14	VHLD	I	Video hold signal input.	61	R/W	O	Not used.
15	MION	I	Not used.	62	WR	O	Write signal output.
16	WE	I	Write enable signal input.	63	RD	O	Read signal output.
17	IRQ	I	Data IRQ input.	64	E	O	Not used.
18	GR MUTE	I	Graphics mute signal input.				

■ YSS205F (IC401)

1. Top View


64～52
1
∫
19
YSS205F
51
∫
33
20～32

2. Inner Block Diagram


/IC
BCI,SDSY,DI
DMPX
CVA
AIL
CHL
A/D
AIR
CHR
MIC
CHM
A/D
CVB
DSP
MICON INTERFACE
/CS
/SCK
CDI
MPX
BCO
L/R
DO
D/A
AOL
AOR
PSRAM INTERFACE
CLOCK GENERATOR
MA0-I4
MD0-7
/CE0,/CEI
/OE,/WE
XI
XO
MCKO
384/256

3. Terminal Function

Pin No.	Symbol	I/O	Function and Operation
1,15,17	NC	--	Not used.
2~7	MD2 ~MD27	I/O	Interface data terminal.
8	CDI	I	Serial data (Micon interface).
9	/CS	I	Chip select data (Micon interface).
10,42	VDD	--	+5V (for Digital).
11	/SCK	I	Serial clock (Micon interface).
12	DI	I	Serial data (Digital sound signal input).
13	SDSY	I	L/R clock (Digital sound signal input).
14	BCI	I	Bit clock (Digital sound signal input).
16,32,58,60	VSS	--	GND (for Digital).
18,31	AVSS	--	Connect to GND.
19	CVB	O	Center voltage of right channel (microphone).
20	MIC	I	A/D input terminal for analog sound (microphone channel).
21	CHM	--	Connected sample and hold capacitor for microphone input signal.
22	CHR	--	Connected sample and hold capacitor for analog right input.
23	AIR	I	A/D input terminal for analog sound and right channel.
24,26	AVDD	--	Connect to GND.
25	AIL	I	A/D input terminal for analog sound and left channel.
27	CHL	--	Connected sample and hold capacitor for analog left input signal.
28	CVA	O	Center voltage of left channel.
29	AOL	O	D/A input terminal for analog sound and left channel.
30	AOR	O	D/A input terminal for analog sound and right channel.
33	BCO	O	Bit clock (Digital sound signal output).
34	L/R	O	L/R clock (Digital sound signal output).
35	DO	O	Serial data (Digital sound signal output).
36~41 43~51	MA0 ~MA14	O	Interface address terminal.
52,53	/CE0,/CE1	O	Interface chip select terminal.
54	/OE	O	Interface output snable terminal.
55	/WE	O	nterface write enable terminal.
56	XO	O	Quartz oscillator connection terminal.
57	XI	I	Quartz oscillator connection terminal or clock input terminal.
59	MCKO	O	Master clock output.
61	/IC	I	Initial clear terminal.
62	384/256	I	Master clock rate change ("H" = 384fs, "L" = 256fs).
63~64	MD0,MD1	I/O	Interface data terminal.

■CXD2554P(IC705) : DIGITAL FILTER

1. Outline

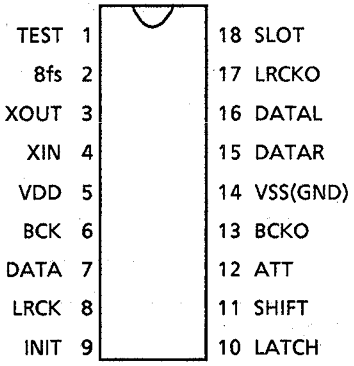
The CXD2554P is a 4-and 8-times oversampling digital filter LSI for a compact disc player. It has the following functions.

- 4-and8-times digital filter
- De-emphasis function
- Attennuating function(Built-in 1st noise shaper)
- Digital offset function
- I / O format

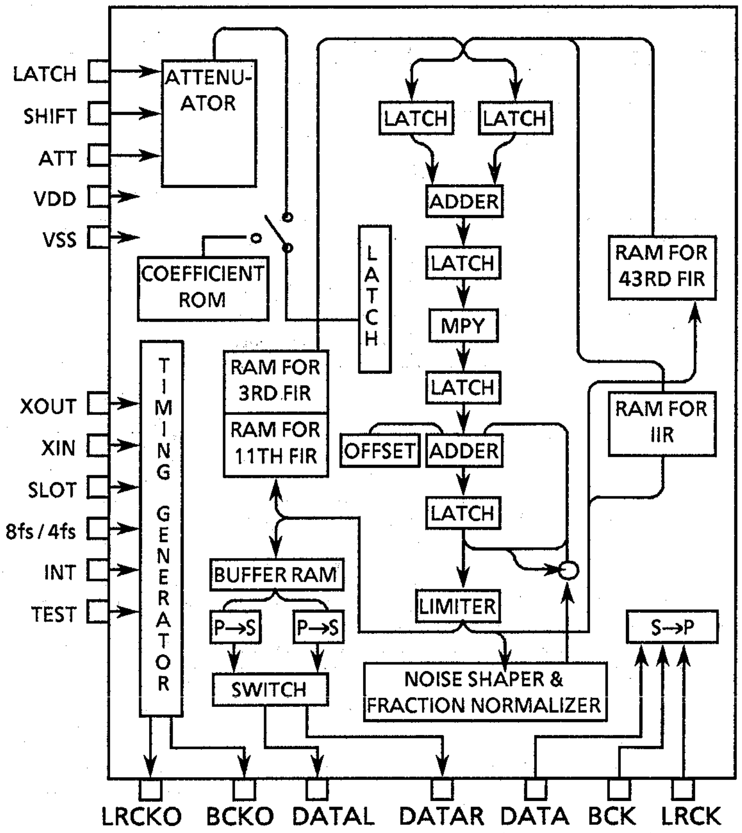
  Input: 2's complement MSB first (serial)

  Output: 2's complement MSB first (serial)
  (16-or18-bit slod selectable)

2. Terminal Layout


TEST 1
8fs 2
XOUT 3
XIN 4
VDD 5
BCK 6
DATA 7
LRCK 8
INIT 9
18 SLOT
17 LRCKO
16 DATAL
15 DATAR
14 VSS(GND)
13 BCKO
12 ATT
11 SHIFT
10 LATCH

3. Internal Block Diagram


LATCH
SHIFT
ATT
VDD
VSS
XOUT
XIN
SLOT
8fs / 4fs
INT
TEST
ATTENU-ATOR
COEFFICIENT ROM
TIMING GENERATOR
LATCH
RAM FOR 3RD FIR
RAM FOR 11TH FIR
BUFFER RAM
P→S
P→S
SWITCH
LATCH
LATCH
ADDER
LATCH
MPY
LATCH
OFFSET
ADDER
LATCH
LIMITER
NOISE SHAPER & FRACTION NORMALIZER
RAM FOR 43RD FIR
RAM FOR IIR
S→P
LRCKO
BCKO
DATAL
DATAR
DATA
BCK
LRCK

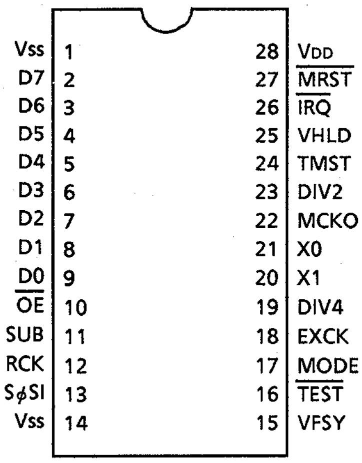
4.Pin description

Pin No.	Symbol	I/O	Description	Pin No.	Symbol	I/O	Description
1	TEST	I	Test pin. Fixed at "L" level in normal operation mode.	10	LATCH	I	Latch clock input
2	8fs/4fs	I	To specify FIR 3. "H" : 8fs "L" : 4fs	11	SHIFT	I	Shift clock input
3	XOUT	O	Master clock output (f = 384fs)	12	ATT	I	Attenuator data input
4	XIN	I	Master clock input (f = 384fs)	13	BCKO	O	BCK output
5	VDD	--	Power supply(+ 5V)	14	VSS	--	Power supply (GND)
6	BCK	I	BCK input	15	DATAR	O	4fs mode: WCK output 8fs mode : RCH serial data output (2's complement)
7	DATA	I	Serial data input (2's complement)	16	DATAL	O	4fs mode:LCH and RCH time division serial data output(2's complement) 8fs mode : LCH serial data output (2's complement)
8	LRCK	I	LRCK input	17	LRCKO	O	LRCK output
9	INIT	I	Re-synchronized by rising edge of this signal	18	SLOT	I	To specify output slot. "H": 18-bit slot "L": 16-bit slot

TEST, 8fs / 4fs and SLOT pins : Pull down resistance

■ VC4118(IC305) : Gate Array

(1) Pin Layout

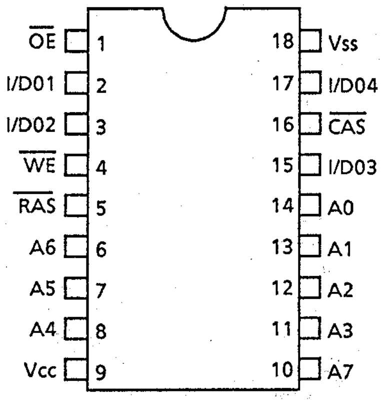

Vss 1
D7 2
D6 3
D5 4
D4 5
D3 6
D2 7
D1 8
D0 9
OE 10
SUB 11
RCK 12
SφSI 13
Vss 14
28 VDD
27 MRST
26 IRQ
25 VHLD
24 TMST
23 DIV2
22 MCKO
21 X0
20 X1
19 DIV4
18 EXCK
17 MODE
16 TEST
15 VFSY

(2) Terminal Functions

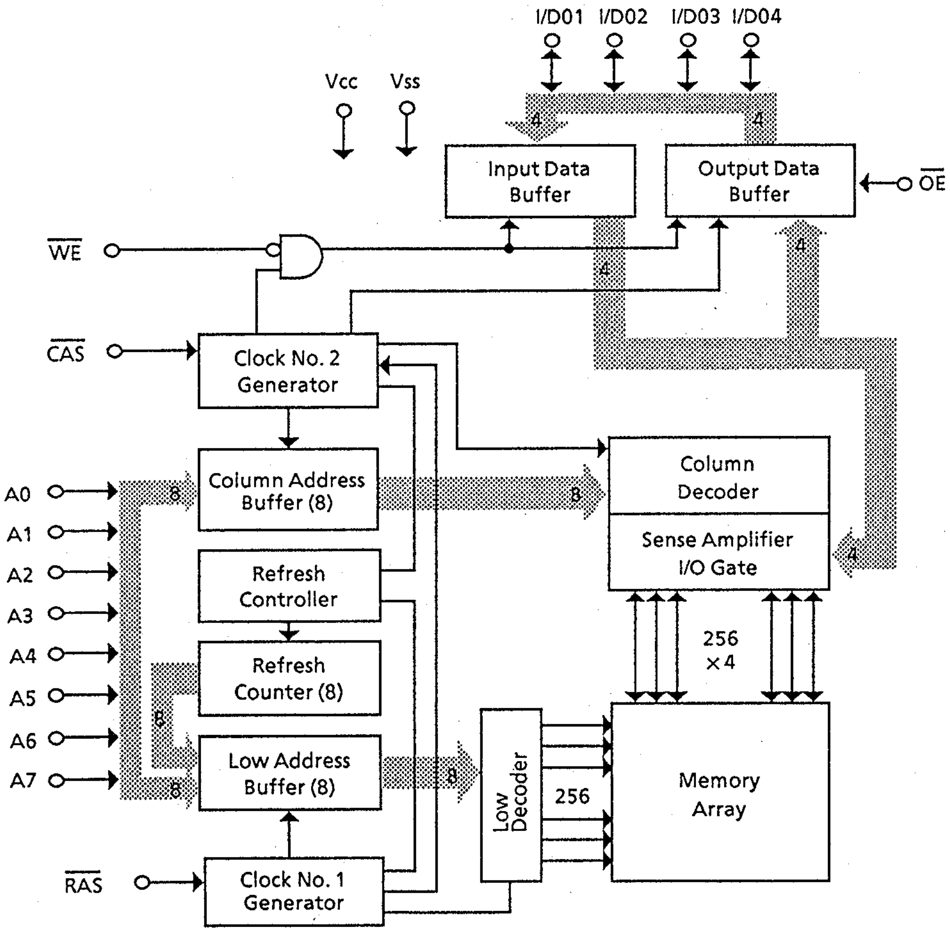
Pin No.	Terminal Name	I/O	Function
2~9	D7~D0	O	Subcode Data 7 (MSB) ⸾ Subcode Data 0 (LSB) (D6~D0 = Q~W,D7 = Subcode Sync)
10	$\overline{\text{OE}}$	I	D0~D7 Output Enable
11	SUB	I	Subcode data input
12	RCK	I	Subcode Read Clock
13	SOS1	I	Sub Frame Sync 0 and Sync 1
15	VFSY	I	V Frame Sync
16	$\overline{\text{TEST}}$	I	Test Mode Input [normal: H]
17	MODE	I	Read Clock (RCK) I/O Mode Select
18	EXCK	I	External Clock [normal (no PLL): L]
19	DIV4	O	Divided by 4 (14/4 MHz Clock out)
20	XI	I	X'tal Oscillator In
21	XO	O	X'tal Oscillator Out
22	MCK0	O	Master Clock Out (14 MHz Clock out)
23	DIV2	O	Divided by 2 (14/2 MHz Clock out)
24	TMST	I	3 minutes Timer Start
25	$\overline{\text{VHLD}}$	O	Video Display Hold (3 min. timer out)
26	$\overline{\text{IRQ}}$	O	Interrupt Request
27	$\overline{\text{MRST}}$	I	Master Reset

■ LH2464-12(IC302): 65536words × 4Bit Dynamic RAM

(1) Terminal Layout

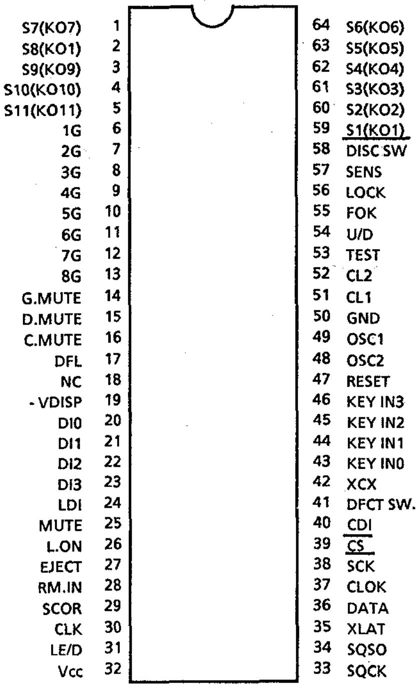

$\overline{OE}$ 1
I/D01 2
I/D02 3
$\overline{WE}$ 4
$\overline{RAS}$ 5
A6 6
A5 7
A4 8
Vcc 9
18 Vss
17 I/D04
16 $\overline{CAS}$
15 I/D03
14 A0
13 A1
12 A2
11 A3
10 A7

(2) Internal Block Diagram


I/D01
I/D02
I/D03
I/D04
Vcc
Vss
4
4
Input Data Buffer
Output Data Buffer
$\overline{OE}$
$\overline{WE}$
4
4
$\overline{CAS}$
Clock No. 2 Generator
A0
A1
A2
A3
A4
A5
A6
A7
8
Column Address Buffer (8)
8
Column Decoder
Sense Amplifier I/O Gate
4
Refresh Controller
256 ×4
Refresh Counter (8)
8
8
Low Address Buffer (8)
8
Low Decoder
256
Memory Array
$\overline{RAS}$
Clock No. 1 Generator

HD404729S (IC201) : Mechanism Controller

1. Terminal Layout


S7(KO7) 1
S8(KO1) 2
S9(KO9) 3
S10(KO10) 4
S11(KO11) 5
1G 6
2G 7
3G 8
4G 9
5G 10
6G 11
7G 12
8G 13
G.MUTE 14
D.MUTE 15
C.MUTE 16
DFL 17
NC 18
-VDISP 19
DI0 20
DI1 21
DI2 22
DI3 23
LDI 24
MUTE 25
L.ON 26
EJECT 27
RM.IN 28
SCOR 29
CLK 30
LE/D 31
Vcc 32
64 S6(KO6)
63 S5(KO5)
62 S4(KO4)
61 S3(KO3)
60 S2(KO2)
59 S1(KO1)
58 DISC SW
57 SENS
56 LOCK
55 FOK
54 U/D
53 TEST
52 CL2
51 CL1
50 GND
49 OSC1
48 OSC2
47 RESET
46 KEY IN3
45 KEY IN2
44 KEY IN1
43 KEY IN0
42 XCX
41 DFCT SW.
40 CDI
39 CS
38 SCK
37 CLOK
36 DATA
35 XLAT
34 SQSO
33 SQCK

2. Pin Description

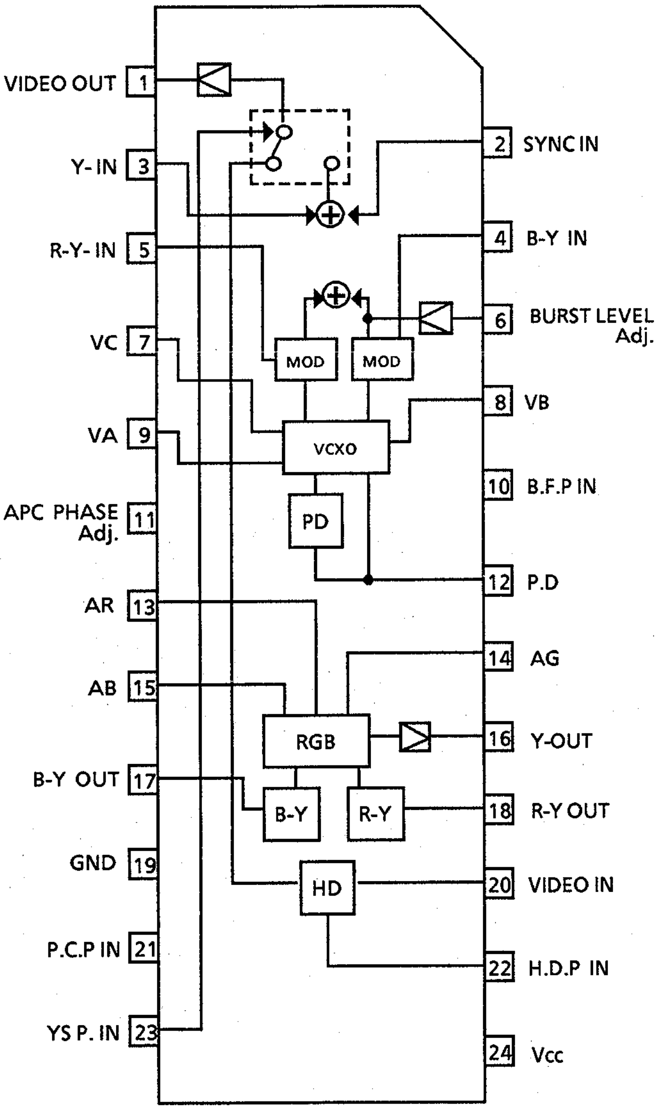
Pin No.	Symbol	I/O	Functions and Operations	Pin NO.	Symbol	I/O	Functions and Operations
1~5	S7(KO7)~ S11(KO11)	O	FL segment control output (Key matrix output)	36	DATA	O	Serial data output to IC401
6~13	1G~8G	O	FL grid control output	37	CLOCK	O	CLOCK signal output for serial data
14	G.MUTE	O	Graphics mute signal output	38	SCK	I	This terminal is connected to μcom.it is an input terminal that carries the clock signal for data transfers
15	D.MUTE	O	Display mute signal output	39	CS	I	This is chip select terminal for IC901
16	C.MUTE	O	Change mute signal output	40	CDI	I	Serial data for IC401
17	DFL	O	Digital filter latch signal output	41	DFCT SW	O	Signal that goes "H" during focus searches
18	----	-	Non connection	42	XCX	O	Signal that goes "H" when the tracking loop is OFF
19	-Vdisp	-	FL power supply	43~46	KEY IN0~ KEY IN3	I	Key in sigmal
20~23	DI0~DI3	I	Communication data	47	RESET	I	Reset signal input
24	LDI	O	Loading end detection signal output	48	OSC2	O	Clock oscillation output
25	MUTE	O	Mute signal output	49	OSC1	I	Clock oscillation input
26	L.ON	O	Laser ON signal output	50	GND	--	GND
27	EJECT	O	Magazine eject signal output	51	CL1	--	Connected to GND
28	RM IN	I	Remote control signal input	52	CL2	--	Non connection
29	SCOR	I	Turns "H" when detecting subcode sync SO or SI is detected	53	TEST	--	Non connection
30	CLK	O	Clock signal input for IC271	54	U/D	I	Hight detect signal
31	LE/D	O		55	FOK	I	Focus OK signal input
32	VCC	--	Power supply	56	LOCK	I	Lock signal input
33	SQCK	O	Clock output signal for reading SQSO	57	SENS	I	Sens signal input
34	SQSO	I	Inputs 80-bit sub Q and 16-bit PCM peak-level data	58	DISC SW	I	Disc hight detect signal
35	XLAT	O	Latch signal for serial data transfer to IC401	59~64	S1(KO1)~ S16KO6)	O	Key out sigmal

■ BA7230LS (IC307): NTSC Encoder

(1) General

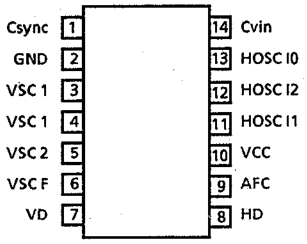
The BA7230LS is an IC for converting the RGB output computer image as well as the superimpose signal of the computer and video image to an NTSC composite signal. It inputs an analog RGB signal, SYNC, BFP (burst flag pulse) and PCP (pedestal clamp pulse) and outputs an NTSC composite signal.

(2) Sketch drawing & Internal Block Diagram

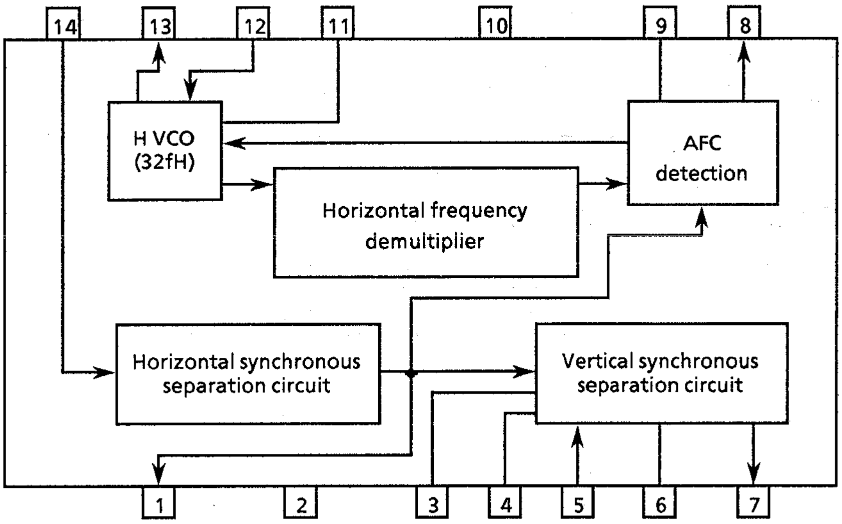

VIDEO OUT 1
Y-IN 3
R-Y-IN 5
VC 7
VA 9
APC PHASE Adj. 11
AR 13
AB 15
B-Y OUT 17
GND 19
P.C.P IN 21
YS P. IN 23
2 SYNC IN
4 B-Y IN
6 BURST LEVEL Adj.
8 VB
10 B.F.P IN
12 P.D
14 AG
16 Y-OUT
18 R-Y OUT
20 VIDEO IN
22 H.D.P IN
24 Vcc
MOD
MOD
VCXO
PD
RGB
B-Y
R-Y
HD

■ M52684AP(IC306) :

1. Terminal Layout


Csync 1
GND 2
VSC 1 3
VSC 1 4
VSC 2 5
VSC F 6
VD 7
14 Cvin
13 HOSC I0
12 HOSC I2
11 HOSC I1
10 VCC
9 AFC
8 HD

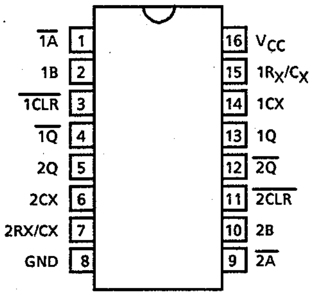
2. Block Diagram


14
13
12
11
10
9
8
H VCO (32fH)
AFC detection
Horizontal frequency demultiplier
Horizontal synchronous separation circuit
Vertical synchronous separation circuit
1
2
3
4
5
6
7

3.Pin function Description

Pin No	Symbol	I/O	Function	Pin No	Symbol	I/O	Function
1	Csync	O	Synchronous signal separation output	9	AFC		AFC Filter
2	GND	--	Connected to GND	10	VCC	--	Power supply
3~4	VSC 1		Vertical Synchronous separation control 1	11	HOSC I1	I	Horizontal oscillator input 2
5	VSC 2		Vertical Synchronous separation control 2	12	HOSC I2	I	Horizontal oscillator input 1
6	VSC F		Vertical Synchronous separation Filter	13	HOSC I0	O	Horizontal oscillator output
7	VD	O	Vertical Synchronous signal output	14	Cvin	I	Signal input
8	HD	O	Horizontal Synchronous signal output				

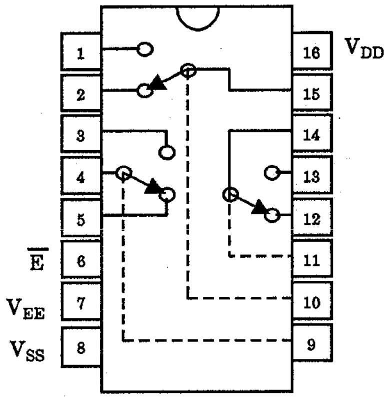
■TC74HC123AP (IC308) : DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR


$\overline{1A}$ 1
1B 2
$\overline{1CLR}$ 3
$\overline{1Q}$ 4
2Q 5
2CX 6
2RX/CX 7
GND 8
16 V_{CC}
15 $1R_X/C_X$
14 1CX
13 1Q
12 $\overline{2Q}$
11 $\overline{2CLR}$
10 2B
9 $\overline{2A}$

INPUTS			OUTPUTS		NOTE
$\overline{A}$	B	$\overline{CLR}$	Q	$\overline{Q}$	
↓	H	H	⊓	⊔	OUTPUT ENABLE
X	L	H	L	H	INHIBIT
H	X	H	L	H	INHIBIT
L	↑	H	⊓	⊔	OUTPUT ENABLE
L	H	↑	⊓	⊔	OUTPUT ENABLE
X	X	L	L	H	INHIBIT

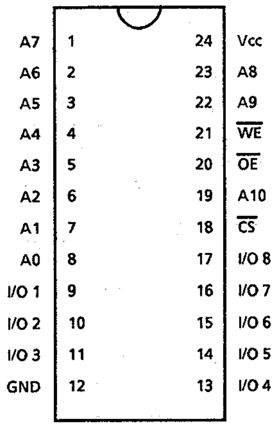
X : Don't care
Cx, Rx : External parts installation terminal

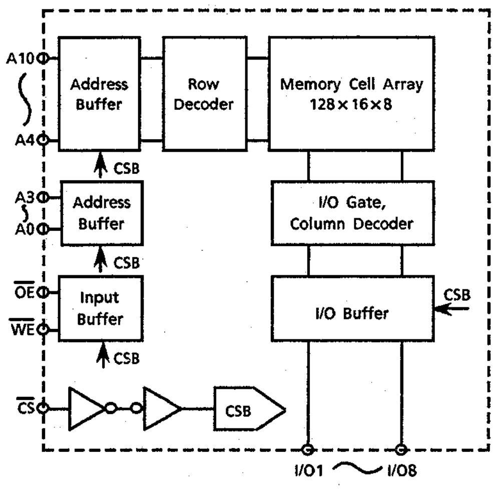
■ TC4053BP (IC707) : ANALOG SWITCH


1
2
3
4
5
$\overline{E}$ 6
V_{EE} 7
V_{SS} 8
16 V_{DD}
15
14
13
12
11
10
9

	Pin 9		Pin10		Pin11	
$\overline{E}$	L	H	L	H	L	H
L	4−5	4−3	15−2	15−1	14−12	14−13
H	All Off					

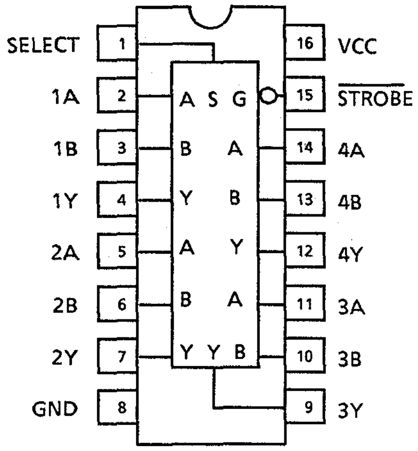
■ LC3517BS-15 (IC304) : Static RAM


A7 1
A6 2
A5 3
A4 4
A3 5
A2 6
A1 7
A0 8
I/O 1 9
I/O 2 10
I/O 3 11
GND 12
24 Vcc
23 A8
22 A9
21 $\overline{WE}$
20 $\overline{OE}$
19 A10
18 $\overline{CS}$
17 I/O 8
16 I/O 7
15 I/O 6
14 I/O 5
13 I/O 4


A10
A4
Address Buffer
Row Decoder
Memory Cell Array 128×16×8
CSB
A3
A0
Address Buffer
I/O Gate, Column Decoder
CSB
$\overline{OE}$
$\overline{WE}$
Input Buffer
I/O Buffer
CSB
CSB
$\overline{CS}$
CSB
I/O1
I/O8

■ TC74HC157AP(IC706)·····2-Channel Multiplexer

(1) Terminal Layout


SELECT
1
1A
2
1B
3
1Y
4
2A
5
2B
6
2Y
7
GND
8
16
VCC
15
STROBE
14
4A
13
4B
12
4Y
11
3A
10
3B
9
3Y
A S G
B A
Y B
A Y
B A
Y Y B

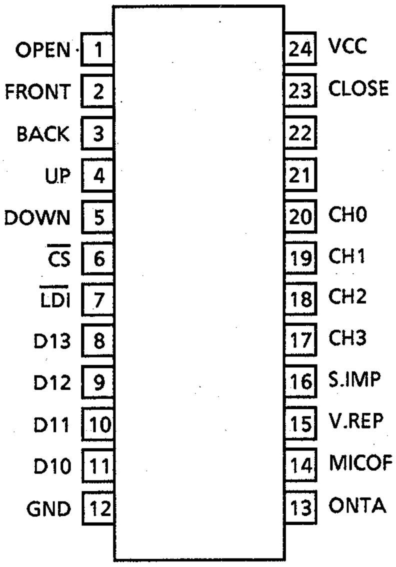
(2) Truth Table

X : DON'T CARE

INPUTS				OUTPUT
STROBE	SELECT	A	B	Y
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

MB88304P(IC203) :

1. Terminal Layout

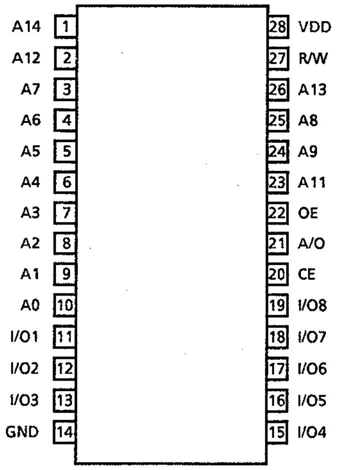

OPEN 1
FRONT 2
BACK 3
UP 4
DOWN 5
$\overline{\text{CS}}$ 6
$\overline{\text{LDi}}$ 7
D13 8
D12 9
D11 10
D10 11
GND 12
24 VCC
23 CLOSE
22
21
20 CH0
19 CH1
18 CH2
17 CH3
16 S.IMP
15 V.REP
14 MICOF
13 ONTA

2. Pin function Description

Pin No	Symbol	I/O	Function	Pin No	Symbol	I/O	Function
1	OPEN	O	"OPEN" signal output	13	ONTA	O	Voice Replace Flug
2	FRONT	O	Loading motor control	14	MICOF	O	Mic ON/OFF control signal
3	BACK	O	Lifter driving control signal	15	V.REP	--	Terminal for internal standard voltage
4	UP	O	Lifter driving control signal	16	S.IMP	--	Not used
5	DOWN	O	Lifter driving control signal	17~20	CH0~CH3	O	Graphics channel signal output
6	CS	--	Connected to GND	21		--	Non connection
7	LDI	I	Strobe input terminal	22		--	Non connection
8~11	D10~D13	I/O	Communication data	23	CLOSE	O	"CLOSE" signal output
12	GND	--	GND	24	VCC	--	Power supply

HM65256BSP(IC902) :

1. Terminal Layout

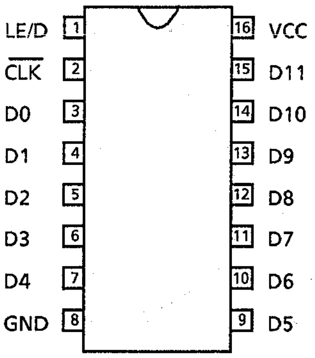

A14 1
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
I/O1 11
I/O2 12
I/O3 13
GND 14
28 VDD
27 R/W
26 A13
25 A8
24 A9
23 A11
22 OE
21 A/O
20 CE
19 I/O8
18 I/O7
17 I/O6
16 I/O5
15 I/O4

2.Pin function Description

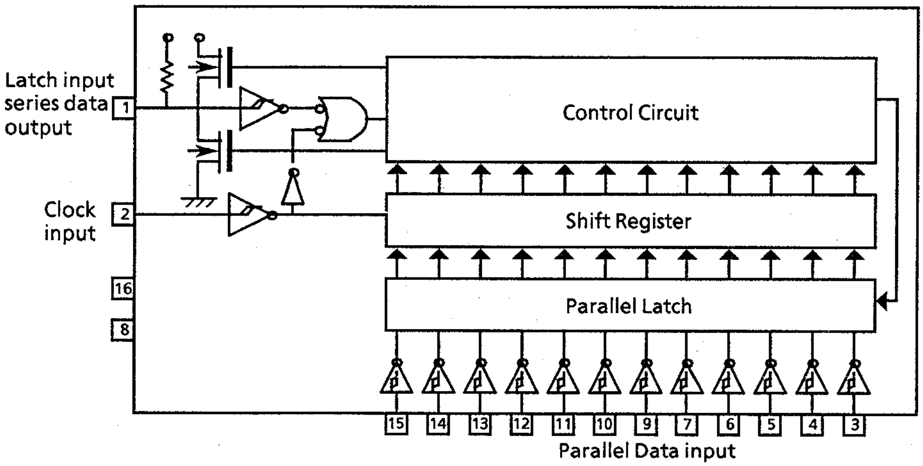
Pin No	Symbol	I/O	Function
1~10	A14,A12 A7~A0	I	Address terminal.
11~13	I/O1~I/O3	I/O	Data terminal.
14	GND	--	GND
15~19	I/O4~I/O8	I/O	Data terminal.
20	CE	I	Chip select.
21	A/O	I	Address terminal.
22	OE	I	Output enable terminal.
23~26	A8,A9,A11,A13	I	Address terminal.
27	R/W	I	Read/Wright.
28	VDD	--	Power supply.

M66007P (IC271) : 12BIT INPUT EXPANDER

1. Terminal Layout

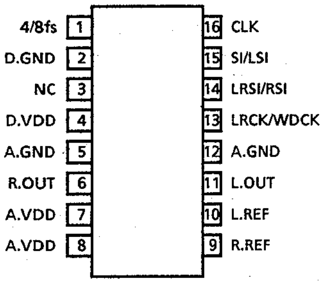

LE/D 1
$\overline{\text{CLK}}$ 2
D0 3
D1 4
D2 5
D3 6
D4 7
GND 8
16 VCC
15 D11
14 D10
13 D9
12 D8
11 D7
10 D6
9 D5

2. Block Diagram

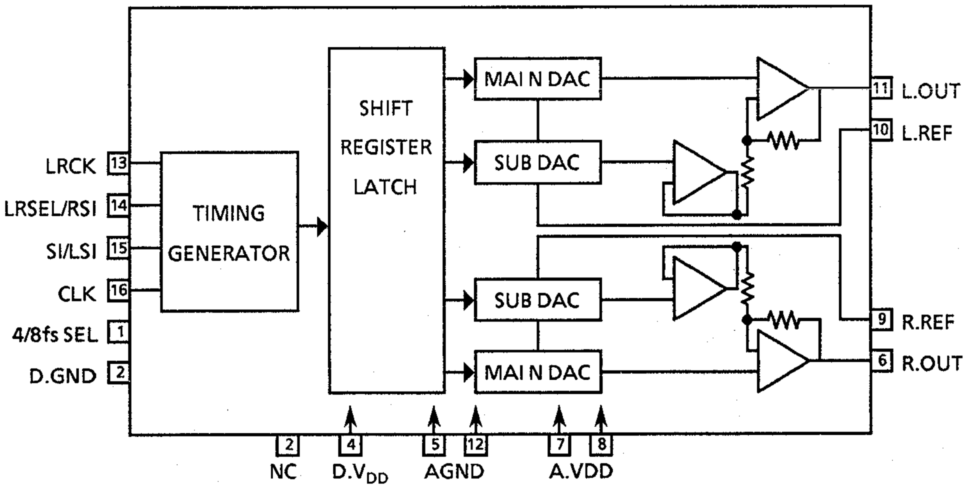

Latch input series data output
1
Clock input
2
16
8
Control Circuit
Shift Register
Parallel Latch
15
14
13
12
11
10
9
7
6
5
4
3
Parallel Data input

■ UPD6376GX (IC703) : D/A CONVERTER

1. Terminal Layout

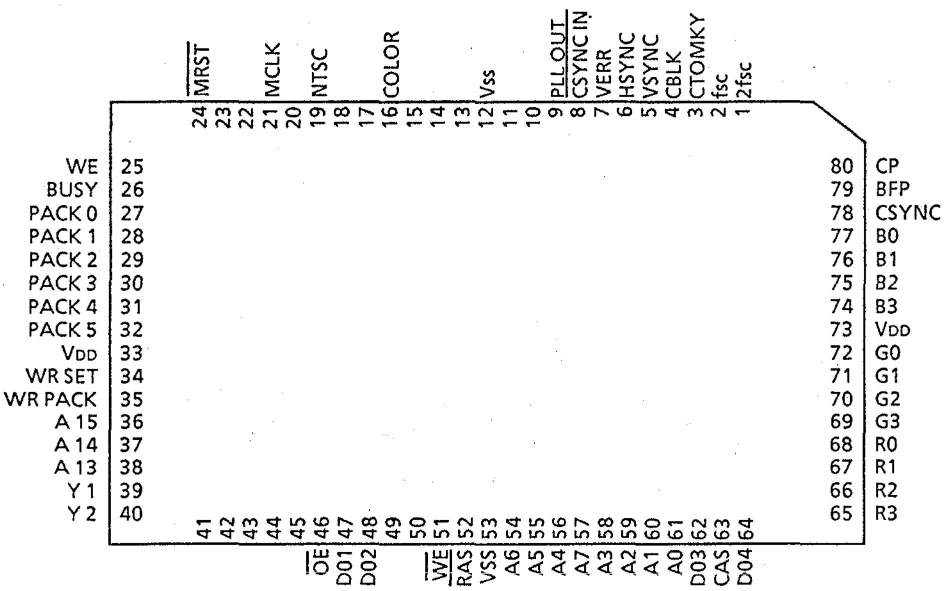

4/8fs 1
D.GND 2
NC 3
D.VDD 4
A.GND 5
R.OUT 6
A.VDD 7
A.VDD 8
16 CLK
15 SI/LSI
14 LRSI/RSI
13 LRCK/WDCK
12 A.GND
11 L.OUT
10 L.REF
9 R.REF

2. Block Diagram


LRCK 13
LRSEL/RSI 14
SI/LSI 15
CLK 16
4/8fs SEL 1
D.GND 2
TIMING GENERATOR
SHIFT REGISTER LATCH
MAI N DAC
SUB DAC
SUB DAC
MAI N DAC
11 L.OUT
10 L.REF
9 R.REF
6 R.OUT
2 NC
4 D.V$_{DD}$
5 12 AGND
7 8 A.VDD

■ VC4117(IC301) : Gate Array

(1) Terminal Layout



24 $\overline{\text{MRST}}$
23
22
21 MCLK
20
19 NTSC
18
17
16 COLOR
15
14
13
12 Vss
11
10
9 $\overline{\text{PLL OUT}}$
8 CSYNC IN
7 VERR
6 HSYNC
5 VSYNC
4 CBLK
3 CTOMKY
2 fsc
1 2fsc
WE 25
BUSY 26
PACK 0 27
PACK 1 28
PACK 2 29
PACK 3 30
PACK 4 31
PACK 5 32
VDD 33
WR SET 34
WR PACK 35
A 15 36
A 14 37
A 13 38
Y 1 39
Y 2 40
41
42
43
44
45
46 $\overline{\text{OE}}$
47 D01
48 D02
49
50
51 $\overline{\text{WE}}$
52 $\overline{\text{RAS}}$
53 VSS
54 A6
55 A5
56 A4
57 A7
58 A3
59 A2
60 A1
61 A0
62 D03
63 CAS
64 D04
80 CP
79 BFP
78 CSYNC
77 B0
76 B1
75 B2
74 B3
73 VDD
72 G0
71 G1
70 G2
69 G3
68 R0
67 R1
66 R2
65 R3

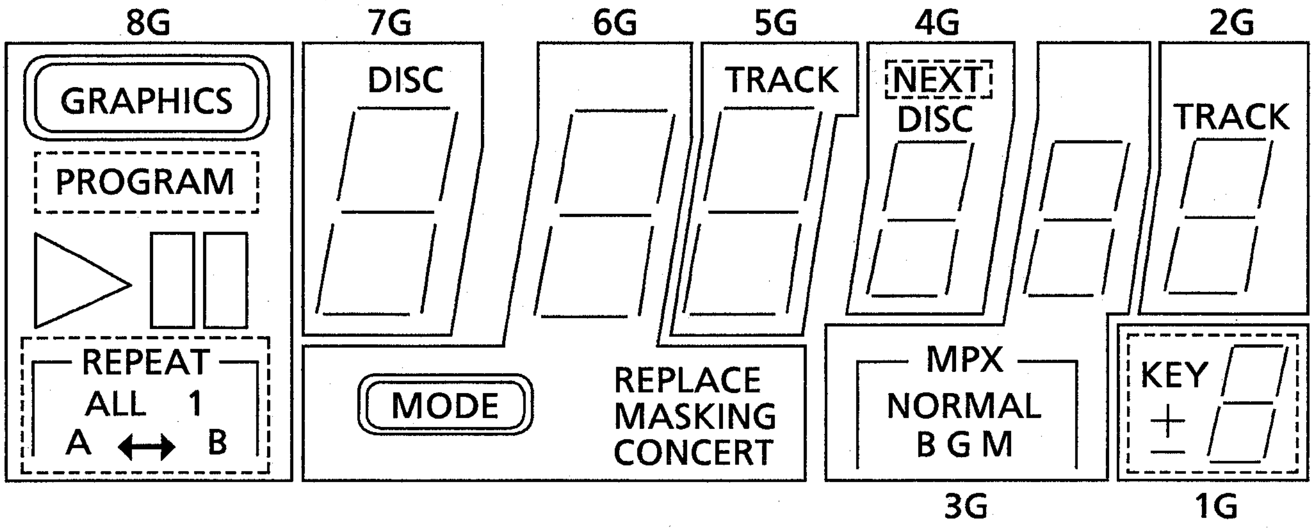
(2) Terminal Functions

Pin No.	Signal Name	I/O	Function	Pin No.	Signal Name	I/O	Function
1	2 fsc	O	2 fsc OUTPOUT (Not used.)	35	WR PACK	O	WRITE PACK DATA
2	fsc	O	fsc OUTPUT	36~38	A13~A15	I	CHIP SELECT IN
3	CROMKY	O	Not used.	39,40	Y1,Y2	O	CHIP SELECT OUT
4	CBLK	O	COMPOSITE BLANKING OUTPUT (Not used.)	41~45	—	—	(Not used.)
5	V SYNC	O	V SYNC OUT (Not used.)	46	$\overline{\text{OE}}$	O	OUTPUT ENABLE
6	H SYNC	O	H SYNC OUT (Not used.)	47,48	D01,D02	I/O	V RAM DATA
7~11	—	—	Not used.	49	—	—	(Not used.)
12	Vss	—	GND	50	$\overline{\text{WE}}$	O	WRITE ENABLE
13~15	—	—	(Not used.)	51	$\overline{\text{RAS}}$	O	ROW ADDRESS STROBE
16	COLOR	I	COLOR BAR	52	VSS	—	GND
17,18	—	—	(Not used.)	53~60	A6~A0	O	V RAM ADDRES
19	NTSC/$\overline{\text{PAL}}$	I	NTSC·$\overline{\text{PAL}}$ Switch	61	D03	I/O	V RAM DATA
20	—	—	(Not used.)	62	$\overline{\text{CAS}}$	O	COLUMN ADDRESS STROBE
21	MCLK	I	MASTER CLOCK	63	D04	I/O	V RAM DATA
22,23	—	—	(Not used.)	64	—	—	(Not used.)
24	$\overline{\text{MRST}}$	I	MASTER RESET	65~68	R3~R0	O	RED DATA
25	WE	O	WRITE ENABLE	69~72	G3~G0	O	GREEN DATA
26	BUSY	O	BUSY	73	VDD	—	Power Supply
27~32	PACK0~PACK5	O	PACK DATA	74~77	B3~B0	O	BLUE DATA
33	VDD	O	Power Supply	78	C SYNC	O	COMPOSITE SYNC SIGNAL
34	WR SET	O	WRITE PRESET DATA	79,80	—	—	Not used.

Internal Connections of FL Display Tube

■ ELU0001-129(FL201)

1. Grid Layout


8G
7G
6G
5G
4G
2G
GRAPHICS
PROGRAM
REPEAT
ALL 1
A ↔ B
DISC
MODE
TRACK
REPLACE
MASKING
CONCERT
NEXT
DISC
MPX
NORMAL
B G M
TRACK
KEY
±
3G
1G

2. Terminal No.

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ELECTRODE	F1	F1	F1	NP	P S12	P S11	P S10	P S9	P S8	P g	P f	P e	P d	P c	P b	P a
TERMINAL NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
ELECTRODE	NP	NP	NP	8G	7G	6G	5G	4G	3G	2G	1G	NP	F2	F2	F2	

Notes F : Filament G: Grid NP : No Pin P : Anode

Disassembly Procedures

1. Removing the top cover

1) Remove the 4 screws fastening both sides of the top cover, and 2 screws fastening the rear side.

2. Removing the front panel

1) Remove the top cover.
2) Remove the 3 screws fastening the top of the front panel,the screw Ⓗ, the plastic rivet and 3 screws fastening the bottom.
3) Remove the front panel.

3. Removing the changer assembly

1) Remove the top cover.
2) Remove the front panel.
3) Remove the 2 screws Ⓐ fastening the changer assembly.
4) Remove the flat wires from their connectors. (ⒷⒸⒹⒺⒻⒼ)
5) Slide the changer assembly to arrow direction Ⓚ
6) Remove the changer assembly.
   * NOTICE (for reinstalling)
   Wire Ⓟ should be set as Fig.4.

4. Removing the turntable base (Fig.2)

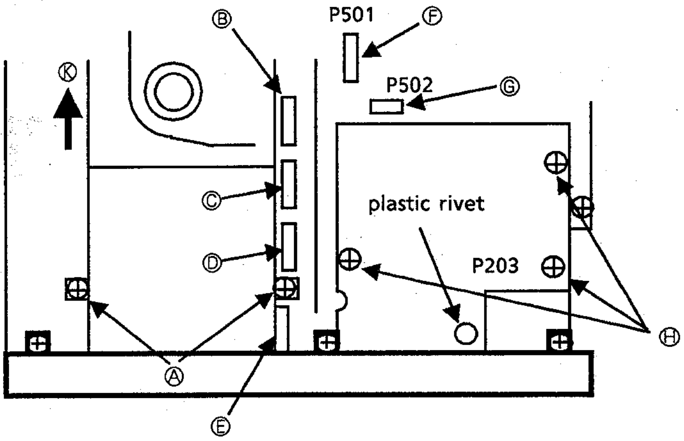
1) Remove the changer assembly.
2) Turn over the changer assembly.
3) Remove the wire protector.
4) Remove the 3 screws Ⓝ.
   * NOTICE : The left side spring differs from the right side ones.
5) Take the turntable base out.

5. Exchanging the pickup (Fig.2)

1) Remove the screwⓁ, and remove the feed nut holder.
2) Remove the Feed Screw assembly.
3) Remove the screw Ⓜ, and remove the Pickup with the pickup shaft.
4) Exchange the pickup.

6. Removing the magazine holder(Fig.3,5)

1) Remove the 2 screws Ⓞfastening the magazine holder.
2) Remove the detector switch P.C. Board.
3) Slide the magazine holder to arrow direction Ⓞ.
4) Remove the magazine holder to upside, and remove the tray stopper at the same time.



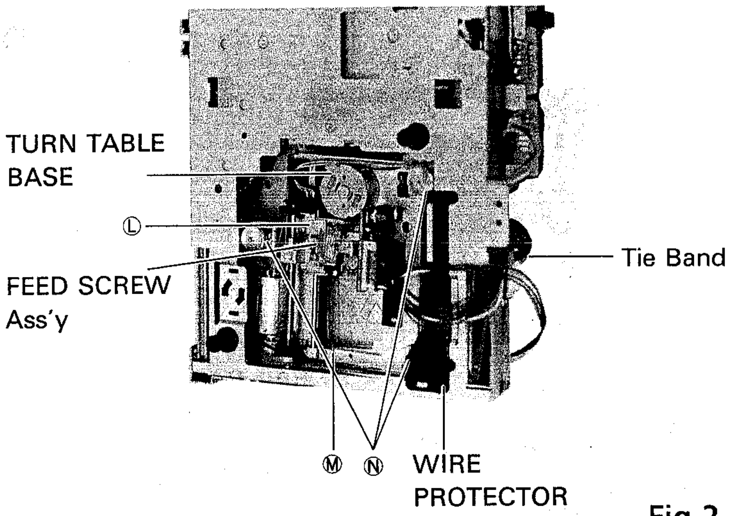


Fig.2

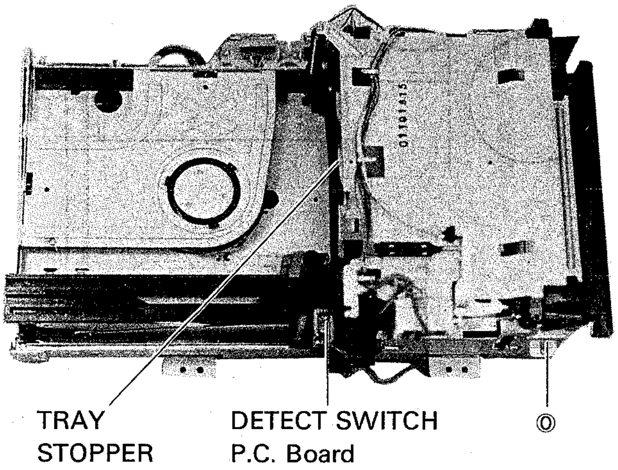


Fig.3

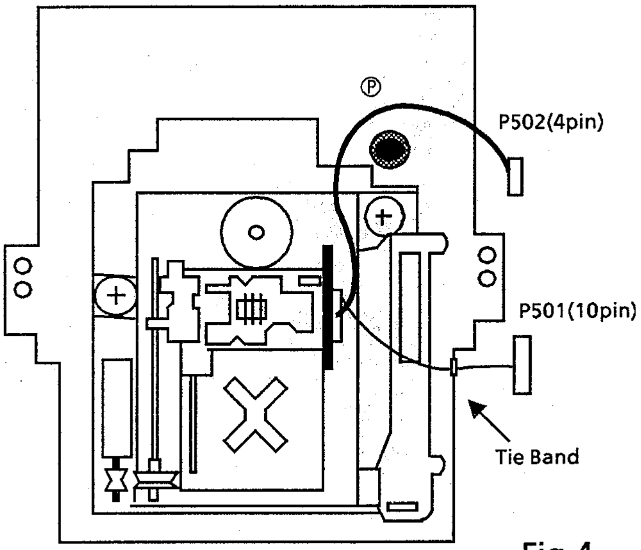


Fig.4

7. Removing the lifter unit assembly (Fig.7)

1) Remove the Magazine holder.
2) Lift the lifter unit assembly to the top position.
3) Remove the elevator arms from the chassis base and the rail base assembly.
4) Remove the lifter unit assembly.

8. Removing the P1 rail base (Fig.6,8)

1) Remove the magazine holder.
2) Rotate the gear Ⓡ clockwise a little.
3) Draw out the P1 rail base.
4) Pull out the P1 tray to back with pulling the stopper.
5) Remove the 2 screwsⓈ.
6) Pull out the P1 rail base with lifting it up a little.

※ Remove the OPEN/CLOSE detect switch in the arrow direction when reinstalling the P1 rail base. And this time, pay attention the gear Ⓡ position. (Fig-9)

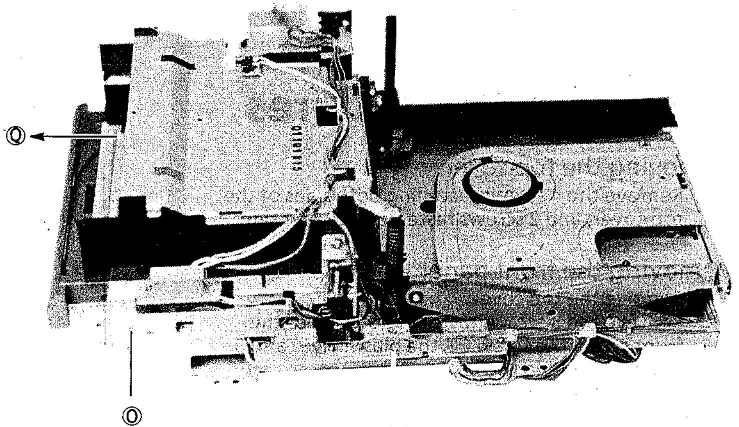


Fig.5

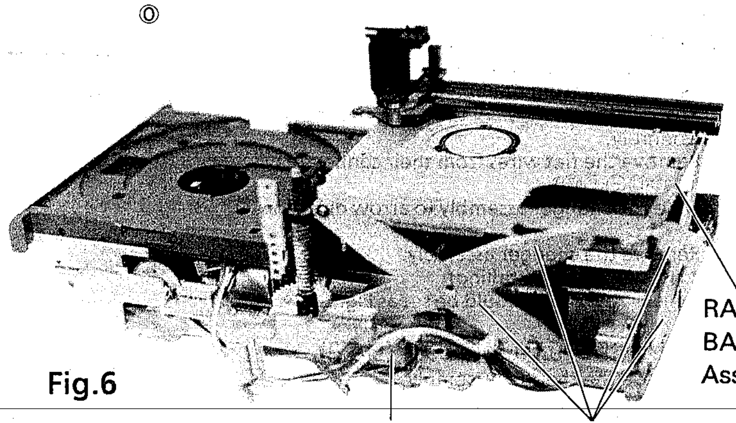

RAIL BASE Ass'y
CHASSIS BASE
ELEVATOR ARM

Fig.7

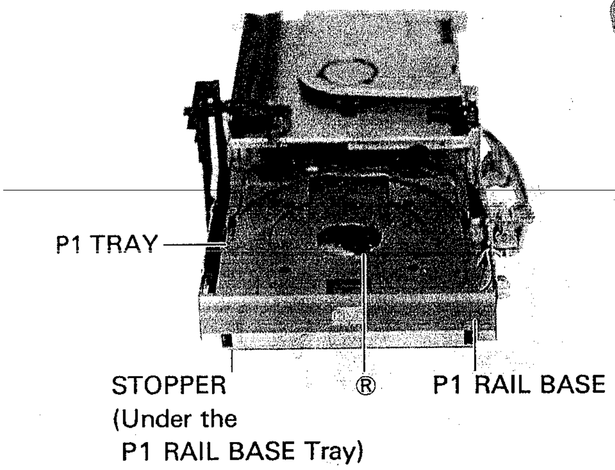

P1 TRAY
STOPPER (Under the P1 RAIL BASE Tray)
Ⓡ
P1 RAIL BASE

Fig.6

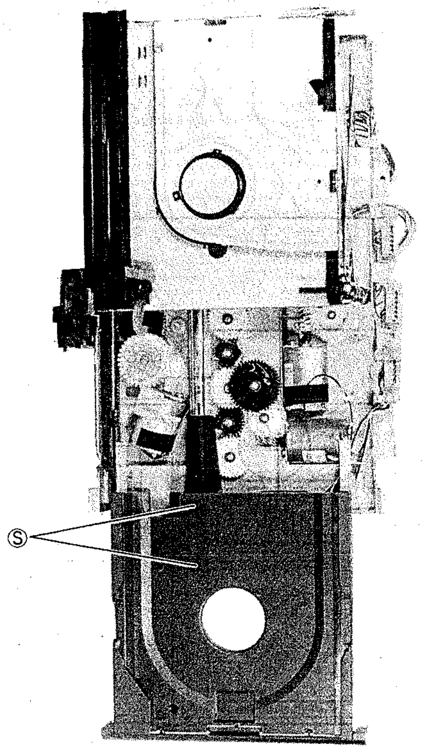


Fig.8

The Gear Position when the P1 Rail Base is pulled out forward.

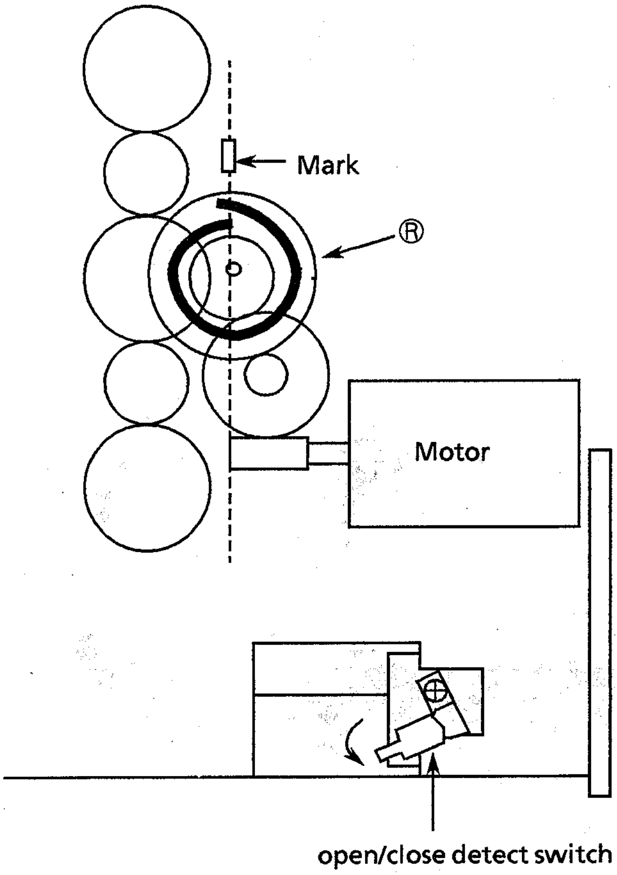
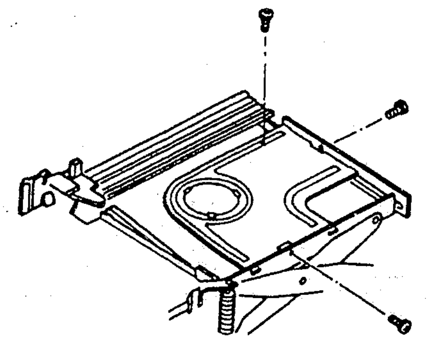

Mark
Ⓡ
Motor
open/close detect switch

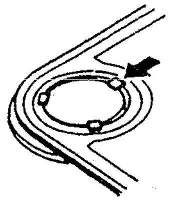
Fig.9

9. Removing the stabilizer

1) Remove the top cover.
2) Remove the 3 screws and the stabilizer bracket when holding up the mechanism assembly.

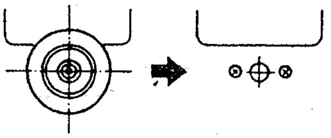


3) Remove the puwls and the stabilizer from the stabilizer holder.



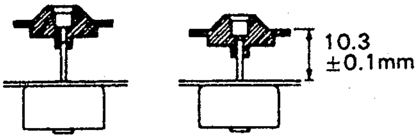
10. Removing the spindle motor

1) Remove the turntable base.
2) Turn over turntable base.
3) Remove the pressed-in turntable.
4) Remove the 2 screws fastening the motor.
5) Remove the spindle motor.



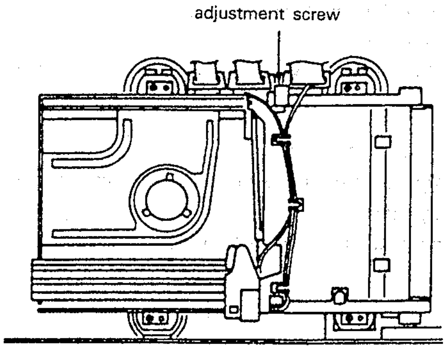
11. Mounting the turntable

1) Alternately tighten the 2 screws.
2) Fit the turntable by pressing gently at the centre to obtain a distance of 10.3mm ±0.1mm .

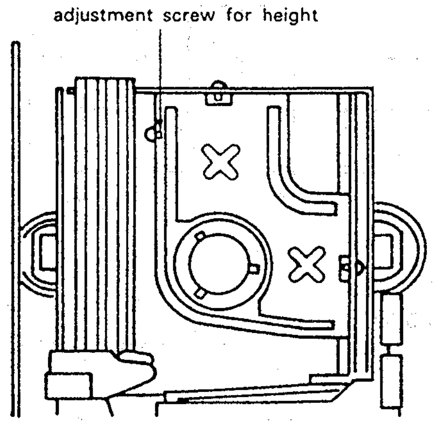


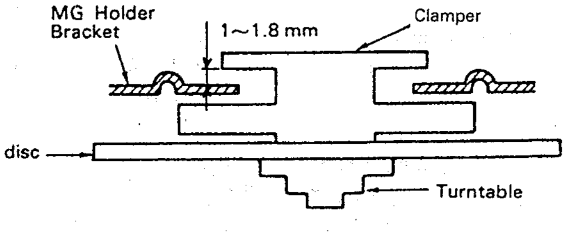
12. Adjusting the height of the lifter unit assembly.

1) Turn on the power. Insert the magazine with no trays.
2) Select disc 3 and turn off the power immediately after the lifter unit reaches the height of disc 3 in the magazine.
3) Look into the window on the front side of the magazine, and confirm that the rail of the lifter unit and the guides in the third slot are at the same level.
4) The adjustment screw which is shown in the figure is used for adjusting the lifter mechanism. The height of the lifter unit assembly does not change when the power is off. Repeat the above three items after turning the screw, and check the height of the guide and the rail.



5) When the height of the mechanism is readjusted or MG Holder Bracket is removed, turn the adjustment screw to adjust the height of the clamper.
The space between clamper and MG Holder Bracket when playing a disc, is shown below.





Adjustment Procedures

1. FE Bias

1) Connect an oscilloscope to TP 6(FE) and TP 3(GND).
2) Adjust R512(FE bias) so that the DC voltage becomes 0 ± 10mV.

2. EF balance

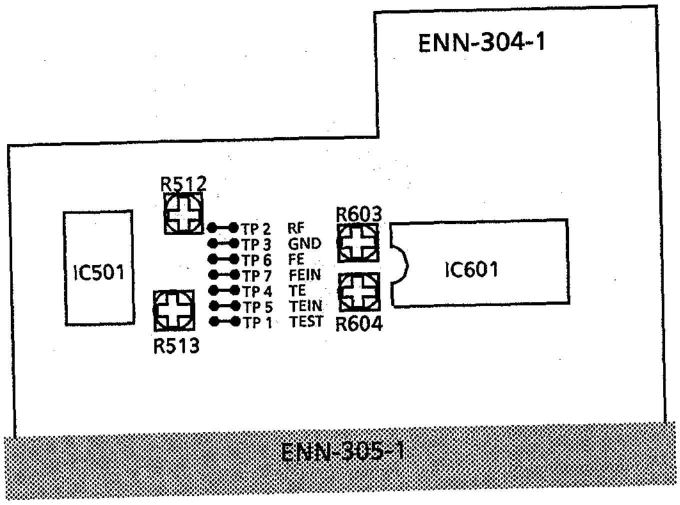
1) Connect an oscilloscope to TP 4(TE) and TP 3(GND).
2) Play a disc.
3) Short-circuit between TP 1(TEST) and TP 3(GND).
4) Adjust R513(EF balance) so that the center of the waveform bocomes 0V.

3. Focus gain

1) Connect an oscilloscope to TP 6(FE) and TP 3(GND).
2) Play a disc.
3) Adjust R603(F.GAIN ADJ.) so that the waveform becomes below figure 1.

4. Tracking gain

1) Connect an oscilloscope to TP 4(TE) and TP 3(GND).
2) Play a disc.
3) Adjust R604(T.GAIN ADJ.) so that the waveform becomes below figure 2.



Focus Gain Adjustment

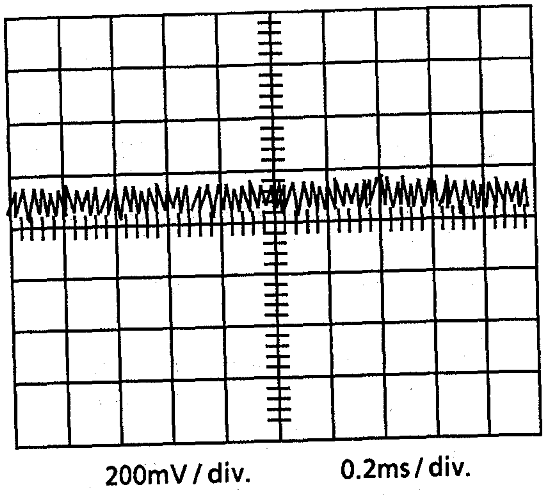


Figure. 1

Tracking Gain Adjustment

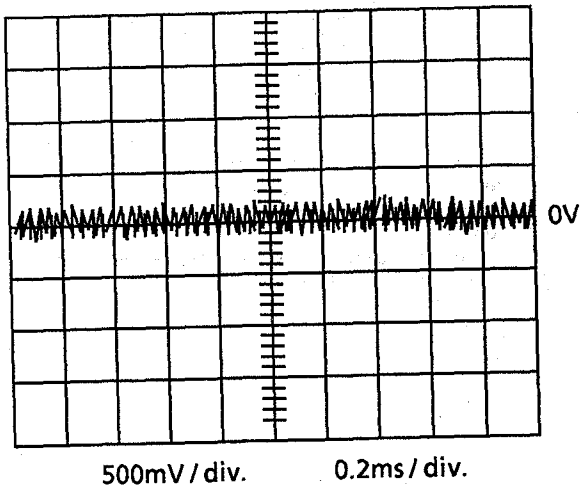


Figure. 2

Note :

If the gain is out of adjustment, the symptoms below will appear.

●Gain too low

Focus gain : Focus is not obtained and disc does not rotate.
Tracking gain : Mechanical shock occurs easily and sound is interrupted. Or time counter display stop counting.

●Gain too high

Focus gain : Scratches (on the disc) easily interrupt play, and noise is increased during play.
Tracking gain : Since the follow-up ability of the pickup is too high, the pickup may oscillate and oscillating sound may output.

As described above, the focus and tracking gain adjustment are performed so as to satisfy mutually contradictory characteristics. Asimplified adjustment procedure is described below. However, since exact adjustment can not be performed prior to adjustments, note(or mark) the positions of the semi-fixed VRs.
If the positions after the simplified adjustment are only different, return the VRs to their original position.

CDG PCB ADJUSTMENT

1. PLL master clock adjustment

1) Supply a signal (full colour pattern Y level white 75%) which is come from a standard TV signal generator, to VIDEO IN.
2) Connect an oscilloscope between TP1 (PLL ADJ) and GND.
3) Adjust L302 as shown in the figure 3.

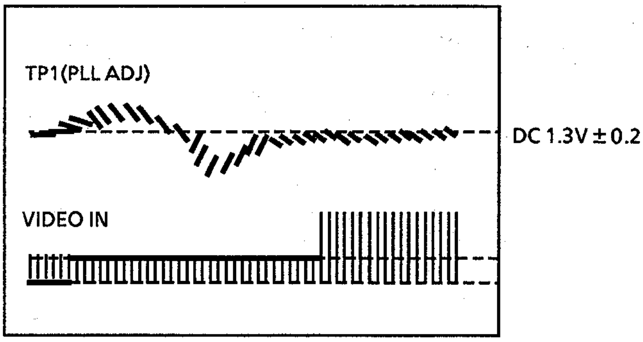


Figure. 3

2. Vector wavafrom adjustment

1) Connect a termination (75Ω) with a vectorscope and connect it with VIDEO OUT.
2) Input a standard TV signal to VIDEO IN.
3) Adjust TC301 and R357 to set a burst position and level of the vector. (See the figure.)
4) Adjust vector of R,MG,YL,G,CY and B with R358 (B-Y) and R359 (R-Y) to center them on its each position in the right figure 4.

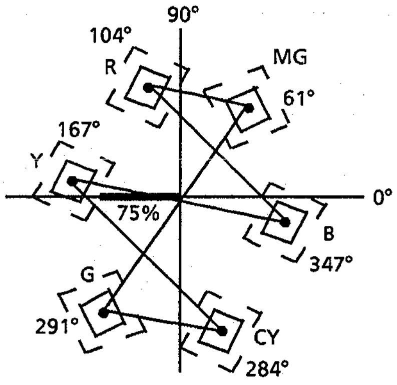


Figure. 4

3. Total adjustment

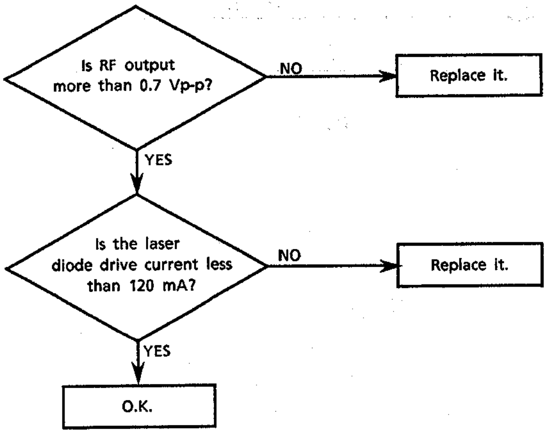
1) Supply a signal to VIDEO IN and superimpose it to confirm that the letters on the picture is colour-locked corectly. Adjust the letters with TC301 shightly if the colour-lock is unstable.
2) Adjust L302 slightly if a skew is appeared on the upper side of the picture.

Maintenance of Laser Pickup

1. Life of the laser diode

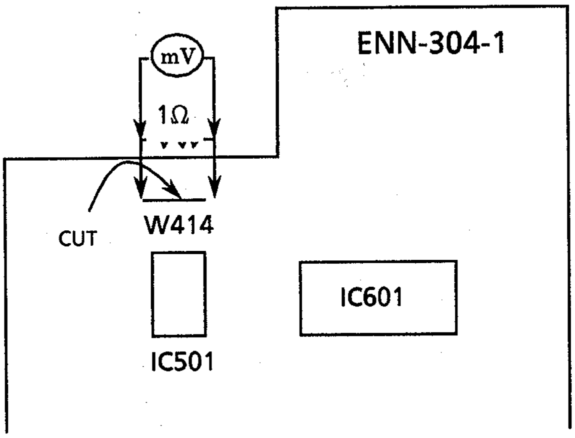
When the life of the laser diode has expired, the following symptoms will appear.

1) The level of RF output (EFM output: amplitude of eye pattern) will be low.
2) The drive current required by the laser diode will be increased.
   In such a case, check the life of the laser diode following the flowchart below


Is RF output more than 0.7 Vp-p?
NO
Replace it.
YES
Is the laser diode drive current less than 120 mA?
NO
Replace it.
YES
O.K.

2. Measurement of laser diode drive current

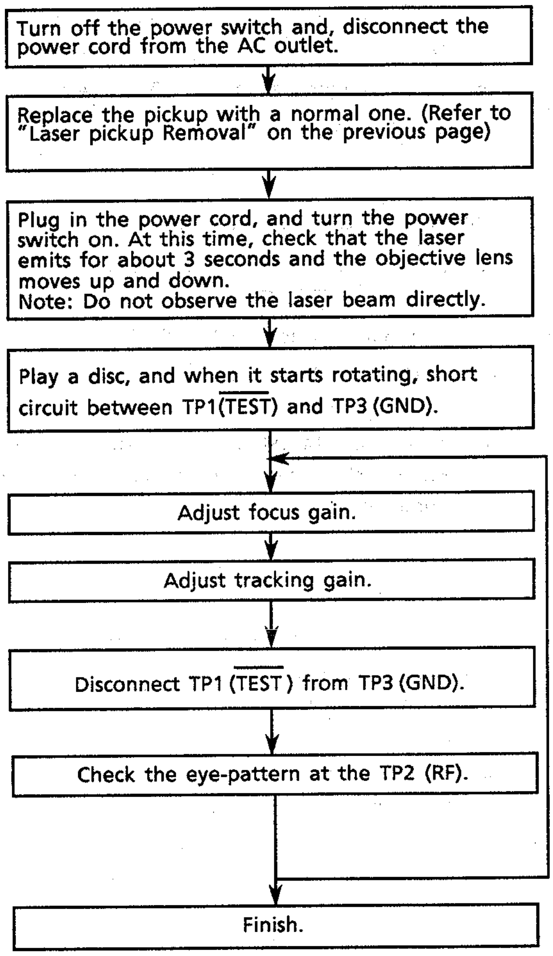
Replace the jump wire (W414) shown below with the resistor (1Ω).
Measure the voltage across the resistor with a milli-voltmeter. When the voltage is more than 120mV, it shows that the life of the laser diode has expired


ENN-304-1
mV
1Ω
CUT
W414
IC501
IC601

3. Semi-fixed resistor on the APC PC board

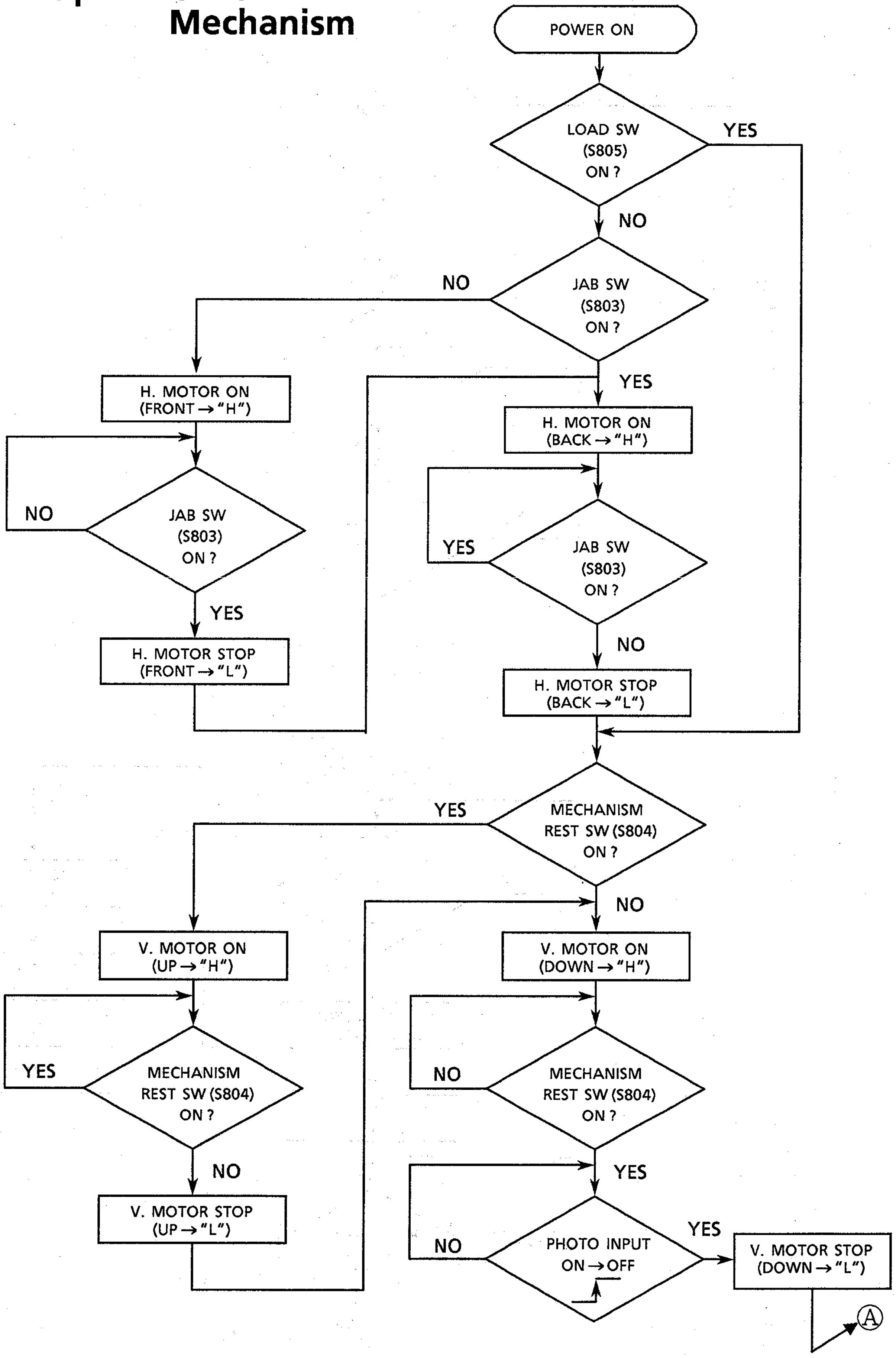
The semi-fixed resistor on the APC printed circuit board which is attached to the pickup is used to adjust the laser power. Since this adjustment should be performed to match the characteristics of the whole optical block, do not touch the semi-fixed resistor.
If the laser power is lower than the specified value, the laser diode is almost worn out, and the laser pickup should be replaced.
If the semi-fixed resistor is adjusted while the pickup is functioning normally, the laser pickup may be damaged due to excessive current.

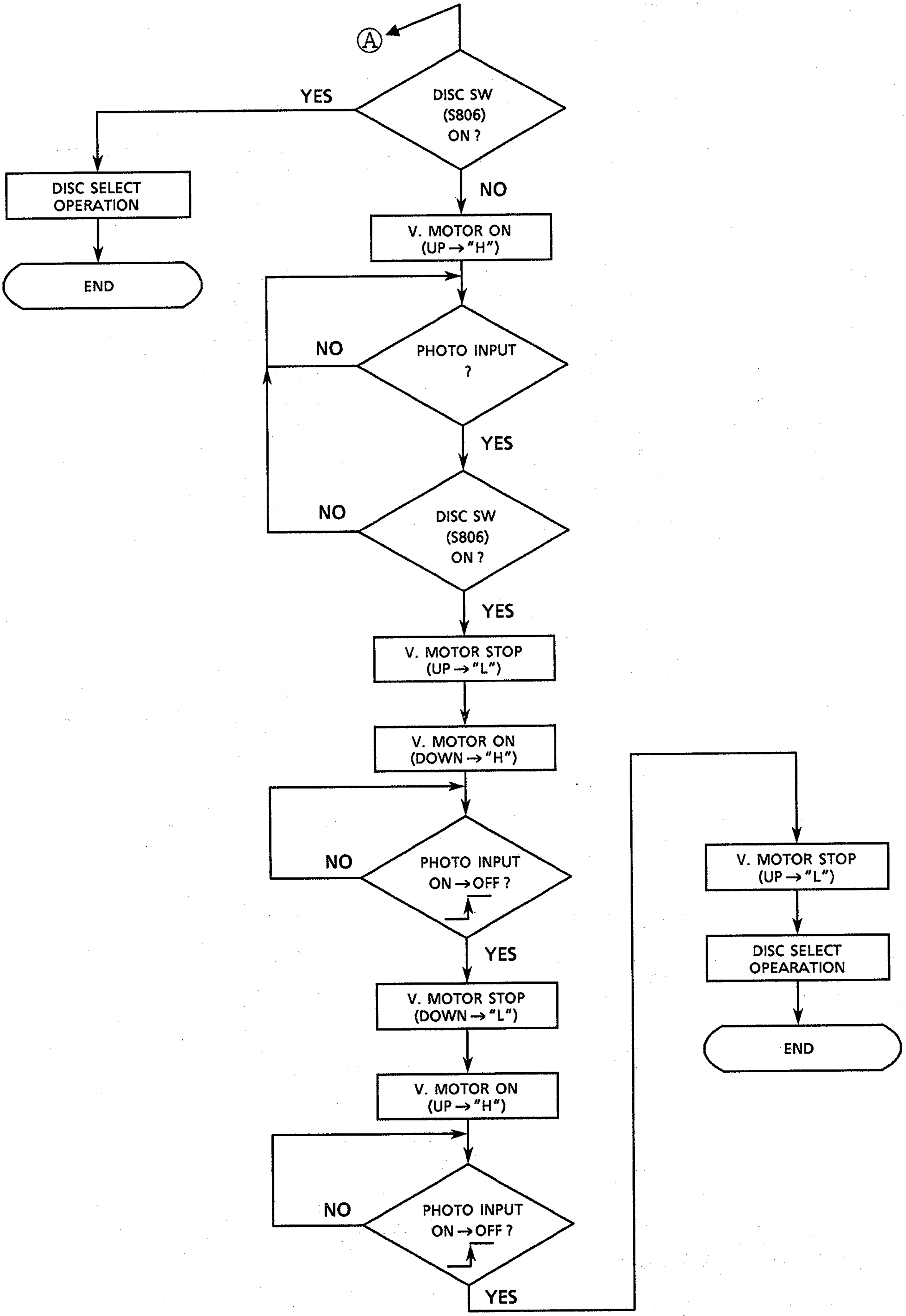
Replacement of Laser Pickup


Turn off the power switch and, disconnect the power cord from the AC outlet.
Replace the pickup with a normal one. (Refer to "Laser pickup Removal" on the previous page)
Plug in the power cord, and turn the power switch on. At this time, check that the laser emits for about 3 seconds and the objective lens moves up and down.
Note: Do not observe the laser beam directly.
Play a disc, and when it starts rotating, short circuit between TP1(TEST) and TP3 (GND).
Adjust focus gain.
Adjust tracking gain.
Disconnect TP1 (TEST) from TP3 (GND).
Check the eye-pattern at the TP2 (RF).
Finish.

Note: Since one adjustment may affect other settings, repeat these adjustments a few times.

Initial Operation of Mechanism


POWER ON
LOAD SW (S805) ON ?
YES
NO
JAB SW (S803) ON ?
NO
YES
H. MOTOR ON (FRONT → "H")
JAB SW (S803) ON ?
NO
YES
H. MOTOR STOP (FRONT → "L")
H. MOTOR ON (BACK → "H")
JAB SW (S803) ON ?
YES
NO
H. MOTOR STOP (BACK → "L")
MECHANISM REST SW (S804) ON ?
YES
NO
V. MOTOR ON (UP → "H")
MECHANISM REST SW (S804) ON ?
YES
NO
V. MOTOR STOP (UP → "L")
V. MOTOR ON (DOWN → "H")
MECHANISM REST SW (S804) ON ?
NO
YES
PHOTO INPUT ON → OFF
NO
YES
V. MOTOR STOP (DOWN → "L")
Ⓐ


Ⓐ
DISC SW (S806) ON ?
YES
NO
DISC SELECT OPERATION
END
V. MOTOR ON (UP → "H")
PHOTO INPUT ?
NO
YES
DISC SW (S806) ON ?
NO
YES
V. MOTOR STOP (UP → "L")
V. MOTOR ON (DOWN → "H")
PHOTO INPUT ON → OFF ?
NO
YES
V. MOTOR STOP (DOWN → "L")
V. MOTOR ON (UP → "H")
PHOTO INPUT ON → OFF ?
NO
YES
V. MOTOR STOP (UP → "L")
DISC SELECT OPEARATION
END

Switches' operation

S801 : Single tray OPEN / CLOSE detect switch
The open and close signals become " Low " when ejecting and closing.

S802 : Magazine IN switch
The switch turns on when inserting a magazine.

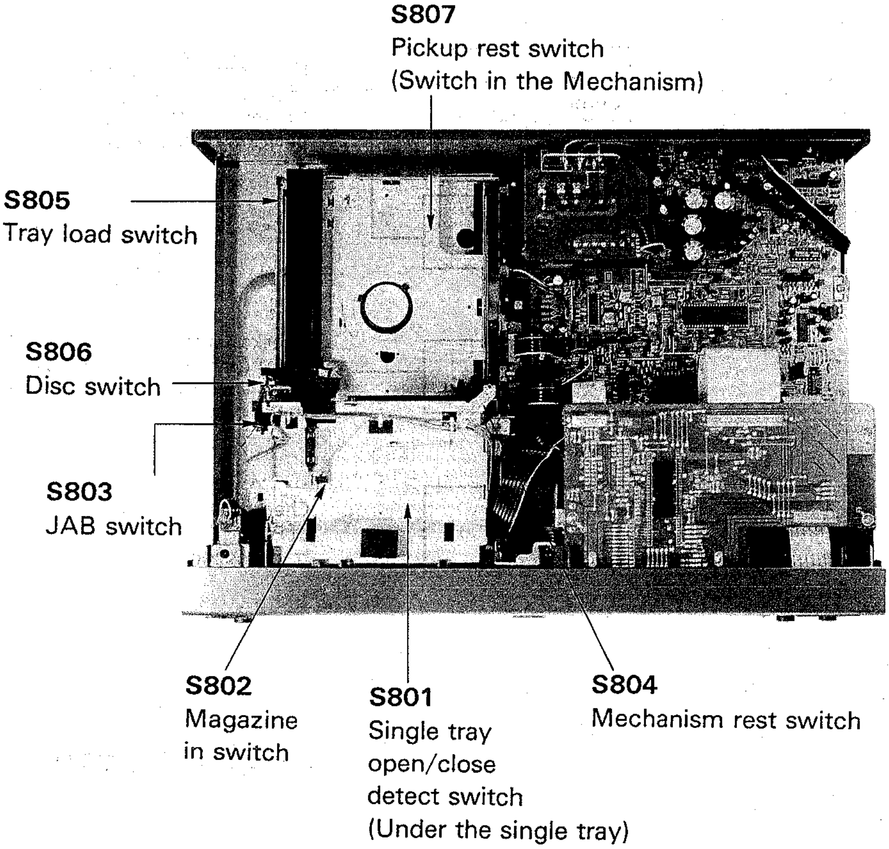
S803 : JAB switch
The switch turns on momentarily when the HOOK SLIDE LEVER touches the switch.

S804 : Mechanism reset switch
The switch turns on when the mechanism sets to the initial height position.

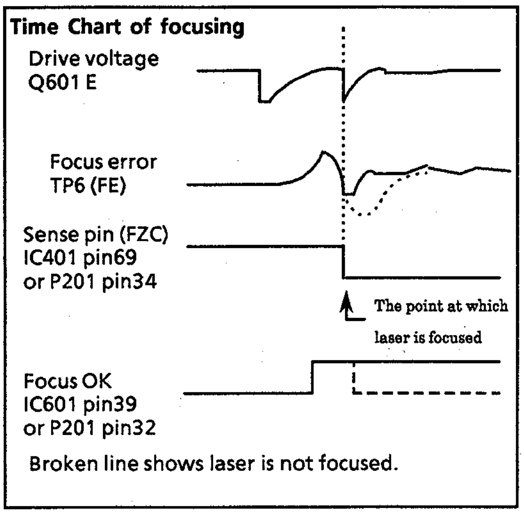
S805 : Tray load switch
The switch turns on when loading the tray.

S806 : Disc switch
The switch detects the tray position in a magazine and returns the tray when turning the power OFF and ON during play mode.

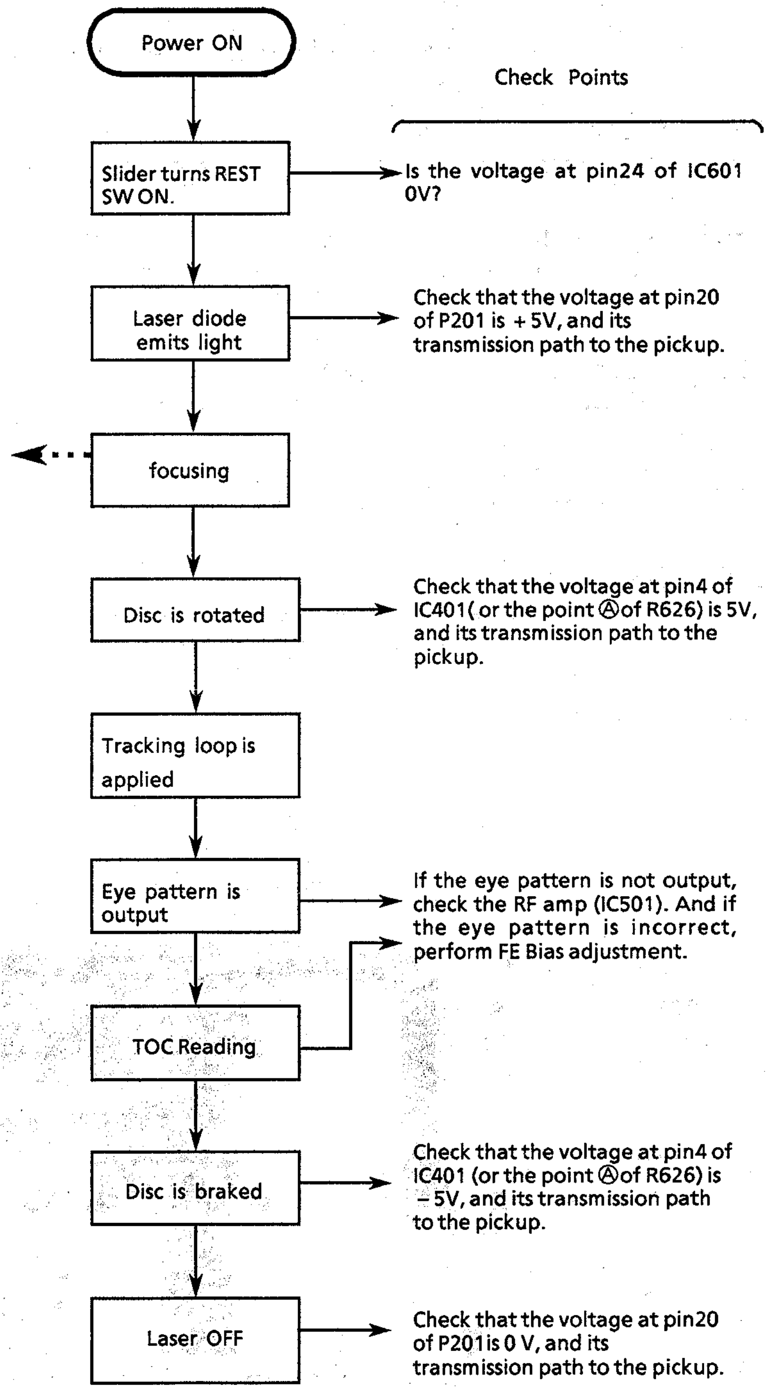
S807 : Pickup rest switch
The switch turns on when the pickup sets to the initial position.


S807
Pickup rest switch
(Switch in the Mechanism)
S805
Tray load switch
S806
Disc switch
S803
JAB switch
S802
Magazine
in switch
S801
Single tray
open/close
detect switch
(Under the single tray)
S804
Mechanism rest switch

Flow of Functional Operation Until TOC is Read



Broken line shows laser is not focused.


Power ON
Check Points
Slider turns REST SW ON.
Laser diode emits light
focusing
Disc is rotated
Tracking loop is applied
Eye pattern is output
TOC Reading
Disc is braked
Laser OFF

Is the voltage at pin24 of IC601 0V?

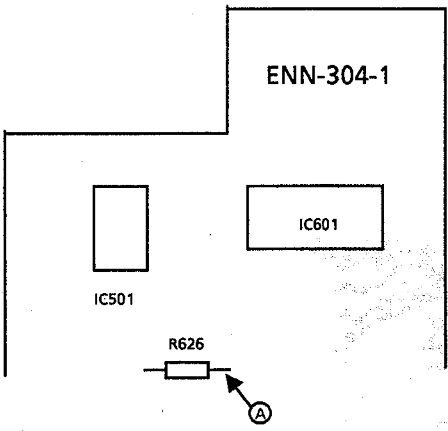
Check that the voltage at pin20 of P201 is +5V, and its transmission path to the pickup.

Check that the voltage at pin4 of IC401 (or the point Ⓐ of R626) is 5V, and its transmission path to the pickup.

If the eye pattern is not output, check the RF amp (IC501). And if the eye pattern is incorrect, perform FE Bias adjustment.

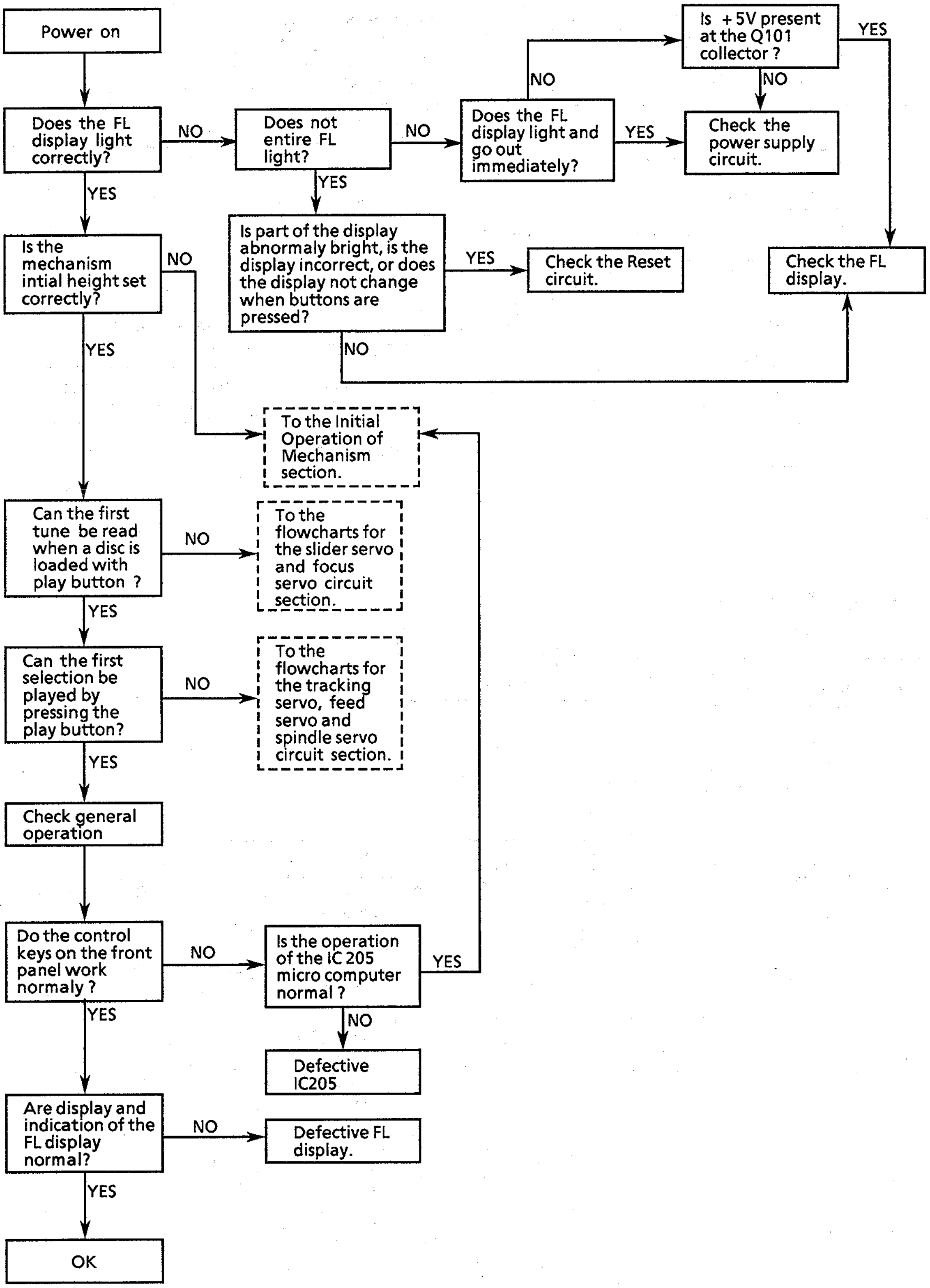
Check that the voltage at pin4 of IC401 (or the point Ⓐ of R626) is −5V, and its transmission path to the pickup.

Check that the voltage at pin20 of P201 is 0 V, and its transmission path to the pickup.

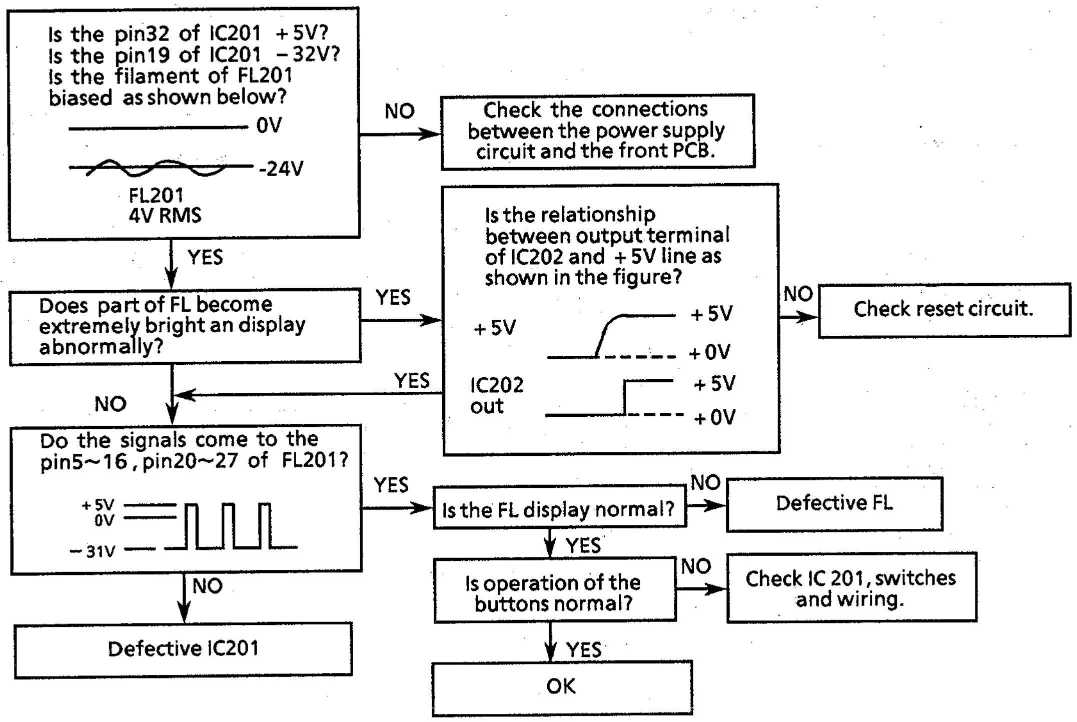

ENN-304-1
IC601
IC501
R626
Ⓐ

Troubleshooting

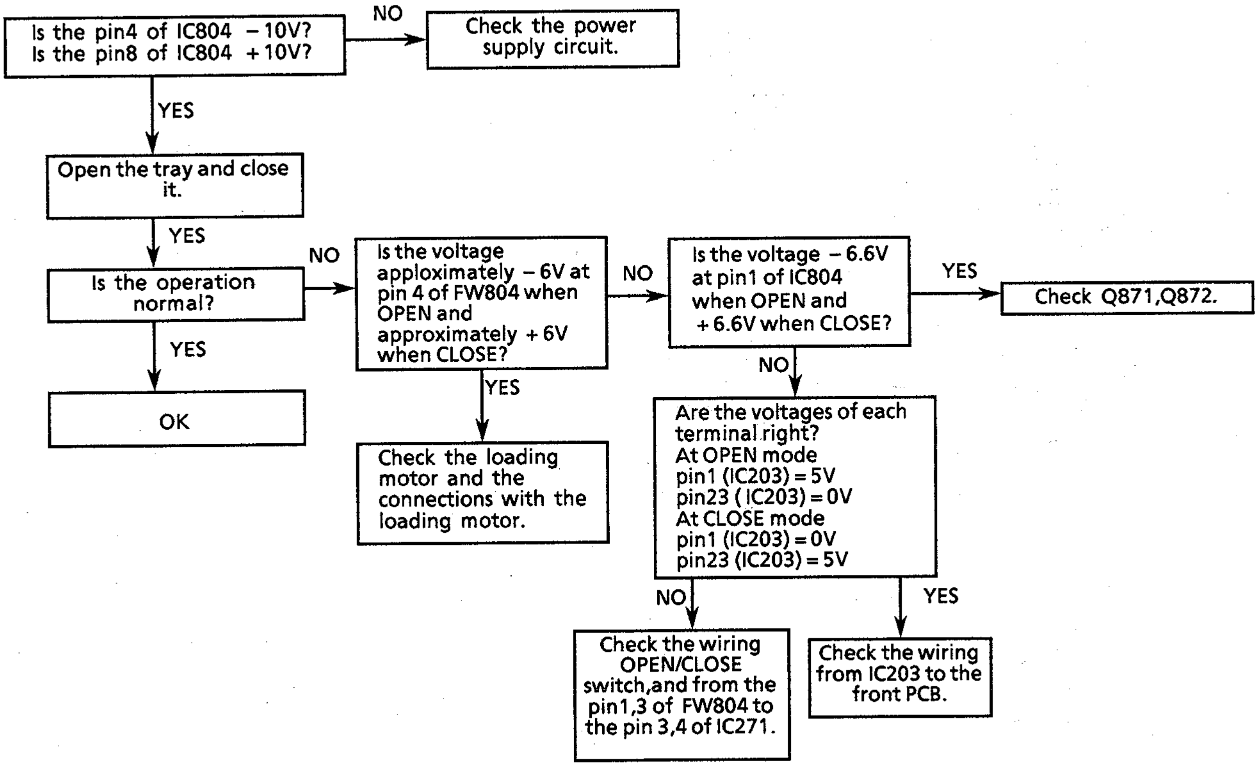
The following flowchart shows each circuit's condition about from "power on" until "ready to play".


Power on
Does the FL display light correctly?
NO
YES
Does not entire FL light?
NO
YES
Does the FL display light and go out immediately?
NO
YES
Is +5V present at the Q101 collector ?
YES
NO
Check the power supply circuit.
Is part of the display abnormaly bright, is the display incorrect, or does the display not change when buttons are pressed?
YES
NO
Check the Reset circuit.
Check the FL display.
Is the mechanism intial height set correctly?
NO
YES
To the Initial Operation of Mechanism section.
Can the first tune be read when a disc is loaded with play button ?
NO
YES
To the flowcharts for the slider servo and focus servo circuit section.
Can the first selection be played by pressing the play button?
NO
YES
To the flowcharts for the tracking servo, feed servo and spindle servo circuit section.
Check general operation
Do the control keys on the front panel work normaly ?
NO
YES
Is the operation of the IC 205 micro computer normal ?
YES
NO
Defective IC205
Are display and indication of the FL display normal?
NO
YES
Defective FL display.
OK

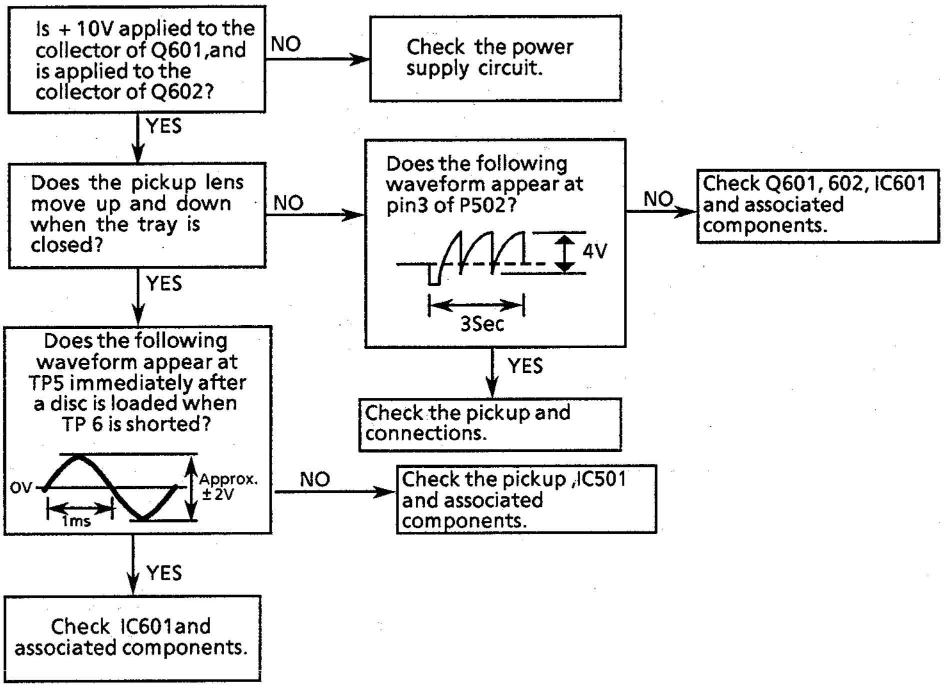
Front Section


Is the pin32 of IC201 +5V?
Is the pin19 of IC201 -32V?
Is the filament of FL201 biased as shown below?
0V
-24V
FL201
4V RMS
NO
Check the connections between the power supply circuit and the front PCB.
YES
Does part of FL become extremely bright an display abnormally?
YES
Is the relationship between output terminal of IC202 and +5V line as shown in the figure?
+5V
+5V
+0V
IC202
out
+5V
+0V
NO
Check reset circuit.
YES
NO
Do the signals come to the pin5~16, pin20~27 of FL201?
+5V
0V
-31V
YES
Is the FL display normal?
NO
Defective FL
YES
Is operation of the buttons normal?
NO
Check IC 201, switches and wiring.
YES
OK
NO
Defective IC201

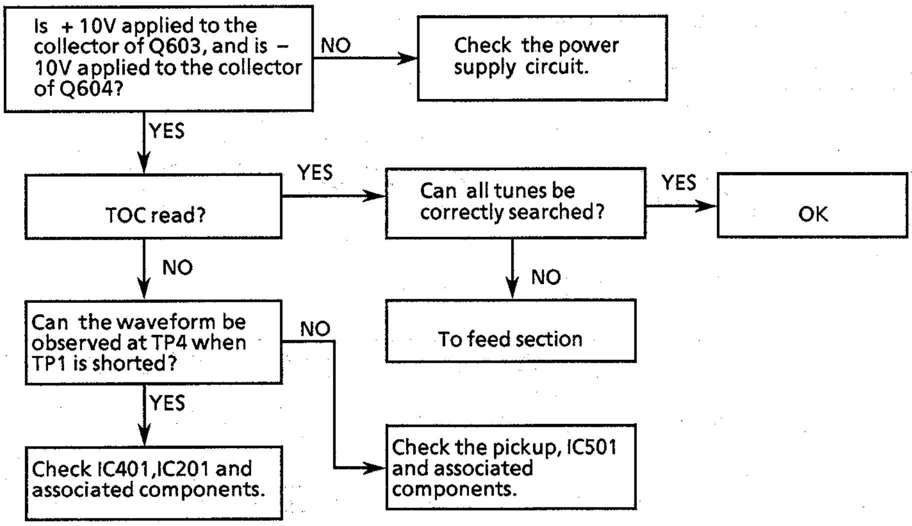
Loading section


Is the pin4 of IC804 -10V?
Is the pin8 of IC804 +10V?
NO
Check the power supply circuit.
YES
Open the tray and close it.
YES
Is the operation normal?
YES
OK
NO
Is the voltage apploximately -6V at pin 4 of FW804 when OPEN and approximately +6V when CLOSE?
YES
Check the loading motor and the connections with the loading motor.
NO
Is the voltage -6.6V at pin1 of IC804 when OPEN and +6.6V when CLOSE?
YES
Check Q871,Q872.
NO
Are the voltages of each terminal right?
At OPEN mode
pin1 (IC203) = 5V
pin23 (IC203) = 0V
At CLOSE mode
pin1 (IC203) = 0V
pin23 (IC203) = 5V
NO
Check the wiring OPEN/CLOSE switch,and from the pin1,3 of FW804 to the pin 3,4 of IC271.
YES
Check the wiring from IC203 to the front PCB.

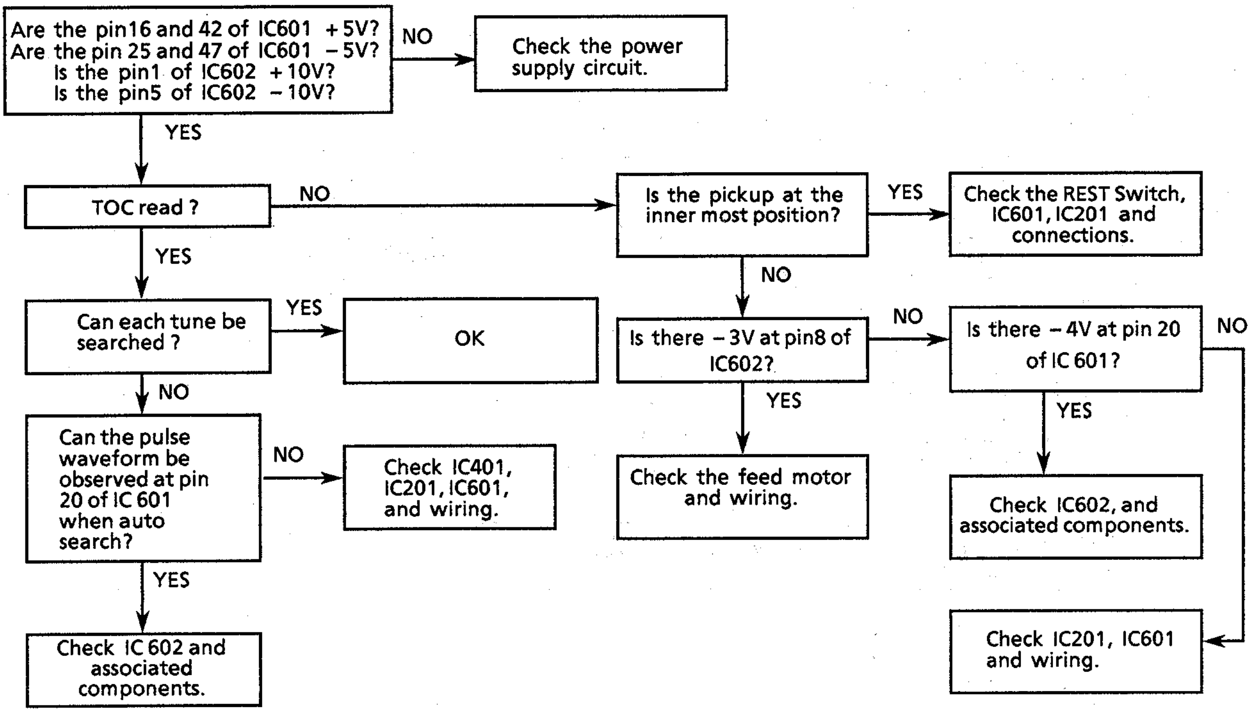
Focus section


Is + 10V applied to the collector of Q601,and is applied to the collector of Q602?
NO
Check the power supply circuit.
YES
Does the pickup lens move up and down when the tray is closed?
NO
Does the following waveform appear at pin3 of P502?
4V
3Sec
NO
Check Q601, 602, IC601 and associated components.
YES
Check the pickup and connections.
YES
Does the following waveform appear at TP5 immediately after a disc is loaded when TP 6 is shorted?
OV
Approx. ±2V
1ms
NO
Check the pickup ,IC501 and associated components.
YES
Check IC601and associated components.

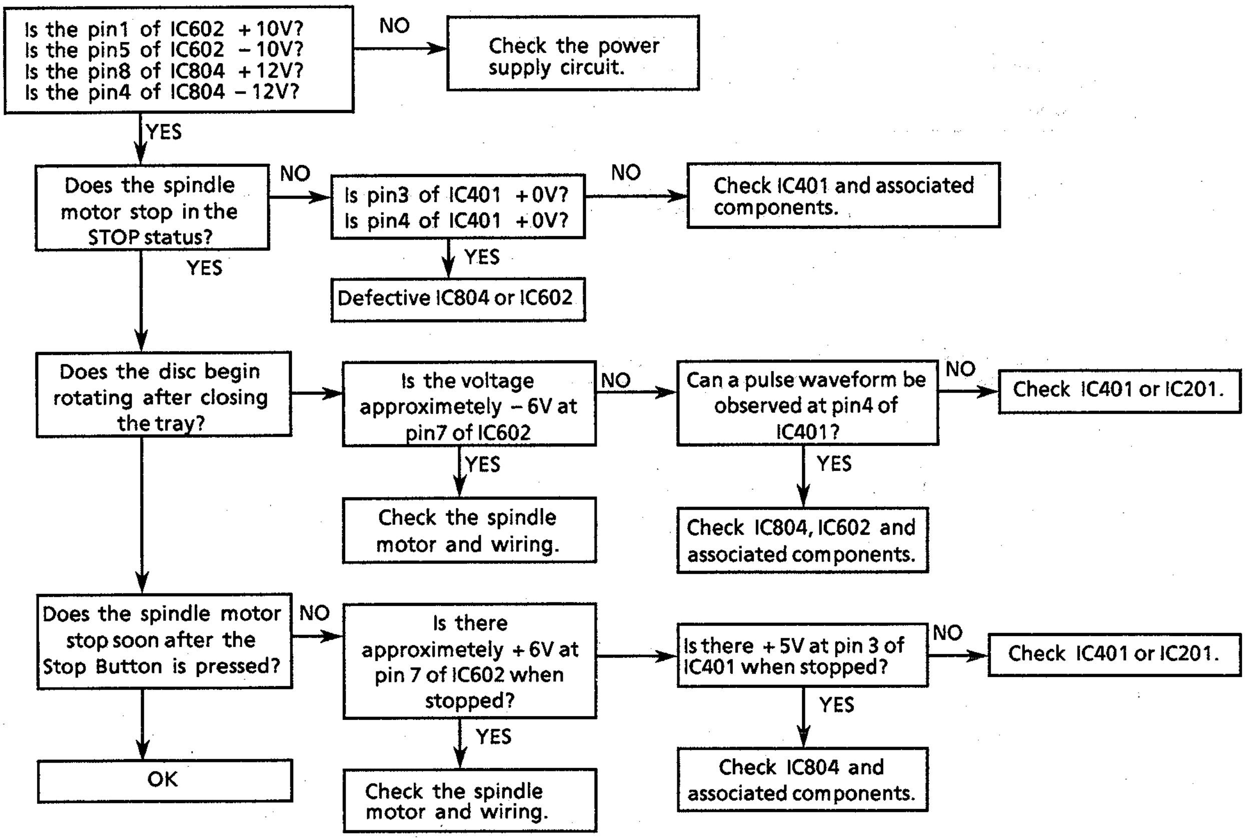
Tracking section


Is + 10V applied to the collector of Q603, and is – 10V applied to the collector of Q604?
NO
Check the power supply circuit.
YES
TOC read?
YES
Can all tunes be correctly searched?
YES
OK
NO
To feed section
NO
Can the waveform be observed at TP4 when TP1 is shorted?
NO
YES
Check IC401,IC201 and associated components.
Check the pickup, IC501 and associated components.

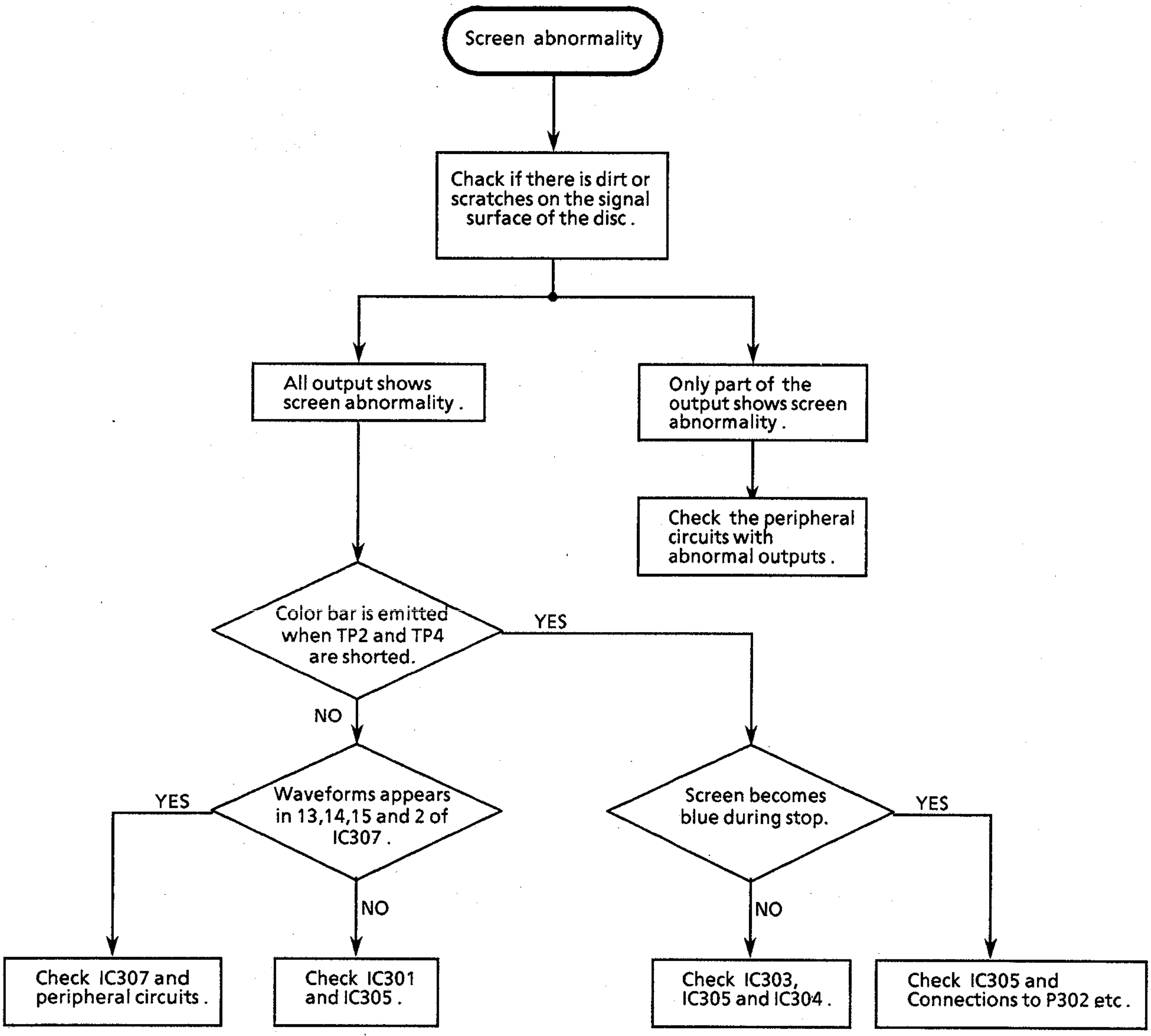
Feed section


Are the pin16 and 42 of IC601 +5V?
Are the pin 25 and 47 of IC601 −5V?
Is the pin1 of IC602 +10V?
Is the pin5 of IC602 −10V?
NO
Check the power supply circuit.
YES
TOC read ?
NO
Is the pickup at the inner most position?
YES
Check the REST Switch, IC601, IC201 and connections.
NO
YES
Can each tune be searched ?
YES
OK
NO
Is there −3V at pin8 of IC602?
NO
Is there −4V at pin 20 of IC 601?
NO
YES
YES
Can the pulse waveform be observed at pin 20 of IC 601 when auto search?
NO
Check IC401, IC201, IC601, and wiring.
Check the feed motor and wiring.
Check IC602, and associated components.
YES
Check IC 602 and associated components.
Check IC201, IC601 and wiring.

Spindle section


Is the pin1 of IC602 +10V?
Is the pin5 of IC602 −10V?
Is the pin8 of IC804 +12V?
Is the pin4 of IC804 −12V?
NO
Check the power supply circuit.
YES
Does the spindle motor stop in the STOP status?
NO
Is pin3 of IC401 +0V?
Is pin4 of IC401 +0V?
NO
Check IC401 and associated components.
YES
YES
Defective IC804 or IC602
Does the disc begin rotating after closing the tray?
Is the voltage approximetely −6V at pin7 of IC602
NO
Can a pulse waveform be observed at pin4 of IC401?
NO
Check IC401 or IC201.
YES
YES
Check the spindle motor and wiring.
Check IC804, IC602 and associated components.
Does the spindle motor stop soon after the Stop Button is pressed?
NO
Is there approximetely +6V at pin 7 of IC602 when stopped?
Is there +5V at pin 3 of IC401 when stopped?
NO
Check IC401 or IC201.
YES
YES
OK
Check the spindle motor and wiring.
Check IC804 and associated components.

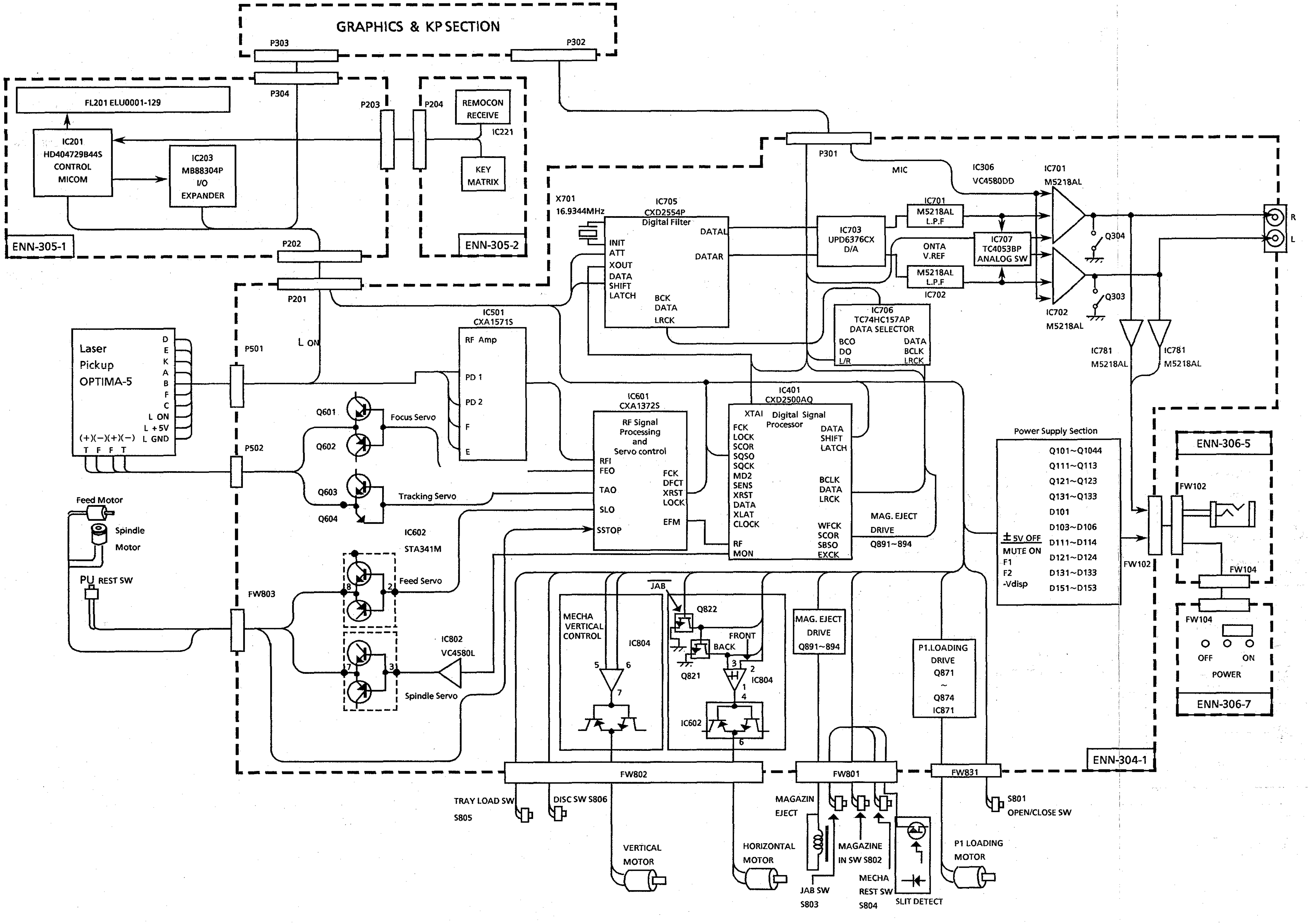
Graphic section


Screen abnormality
Chack if there is dirt or scratches on the signal surface of the disc.
All output shows screen abnormality.
Only part of the output shows screen abnormality.
Check the peripheral circuits with abnormal outputs.
Color bar is emitted when TP2 and TP4 are shorted.
YES
NO
Waveforms appears in 13,14,15 and 2 of IC307.
YES
NO
Screen becomes blue during stop.
YES
NO
Check IC307 and peripheral circuits.
Check IC301 and IC305.
Check IC303, IC305 and IC304.
Check IC305 and Connections to P302 etc.

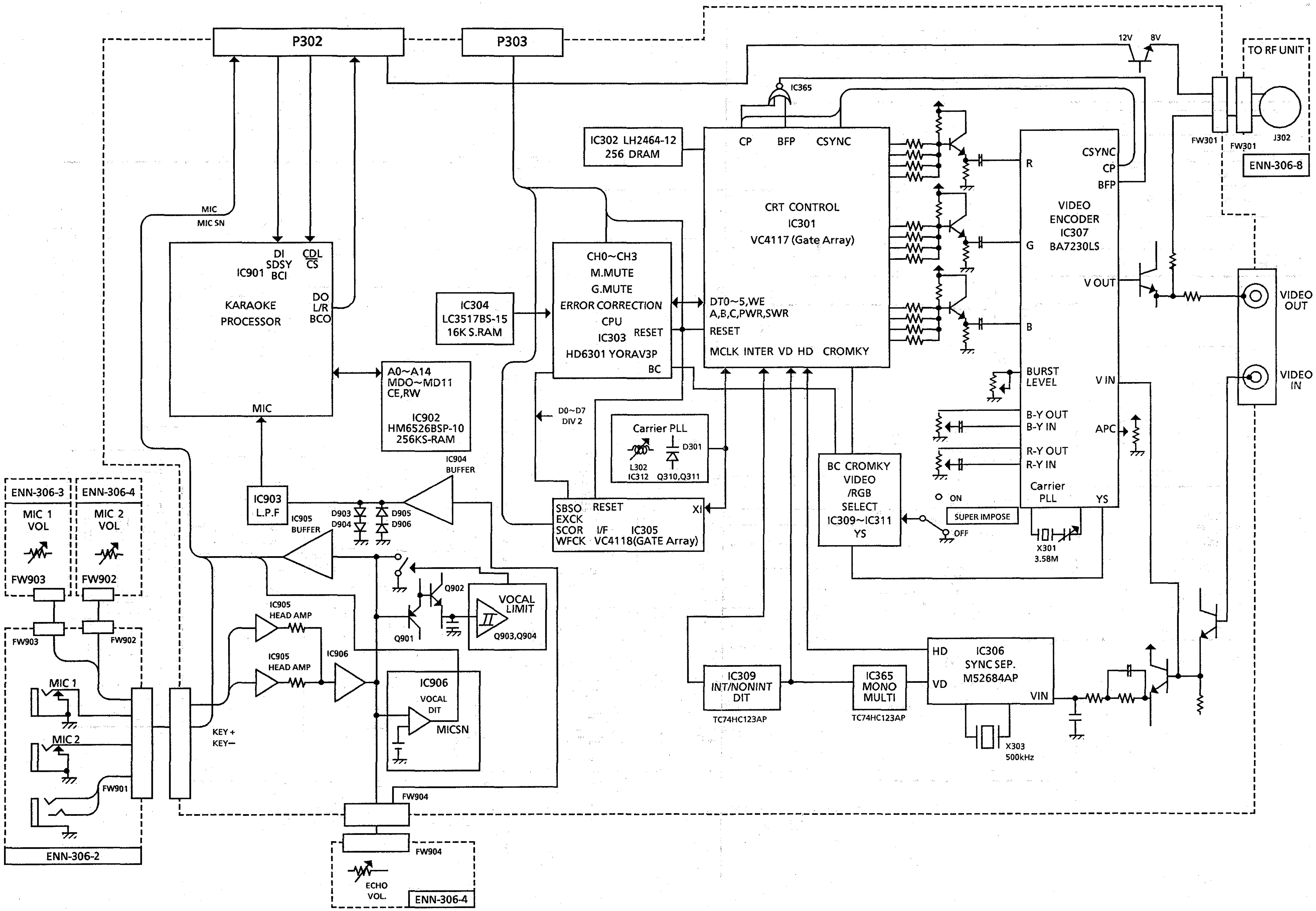
— MEMO —

Block Diagram

■ CD Section

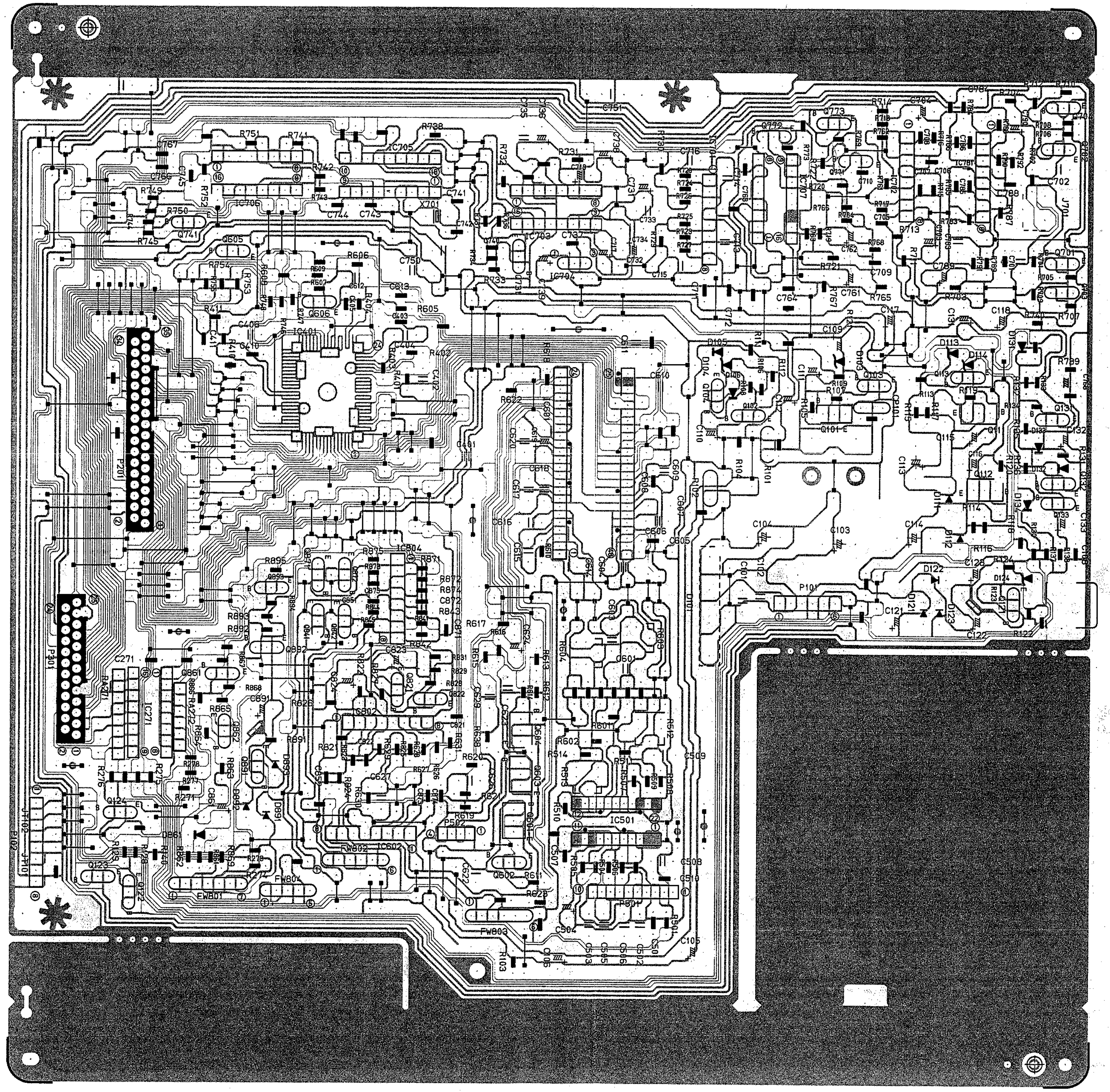

GRAPHICS & KP SECTION
P303
P302
P304
P203
P204
FL201 ELU0001-129
REMOCON RECEIVE
IC221
IC201 HD404729B44S CONTROL MICOM
IC203 MB88304P I/O EXPANDER
KEY MATRIX
ENN-305-1
ENN-305-2
P202
P201
P301
MIC
IC306 VC4580DD
IC701 M5218AL
X701 16.9344MHz
IC705 CXD2554P Digital Filter
INIT
ATT
XOUT
DATA
SHIFT
LATCH
DATAL
DATAR
BCK
DATA
LRCK
IC703 UPD6376CX D/A
IC701 M5218AL L.P.F
ONTA V.REF
IC707 TC4053BP ANALOG SW
M5218AL L.P.F
IC702
Q304
Q303
IC702 M5218AL
R
L
IC706 TC74HC157AP DATA SELECTOR
BCO
DO
L/R
DATA
BCLK
LRCK
IC781 M5218AL
IC781 M5218AL
Laser Pickup OPTIMA-5
D E K A B F C L ON L +5V L GND
(+)(−)(+)(−)
T F F T
P501
L ON
IC501 CXA1571S
RF Amp
PD 1
PD 2
F
E
P502
Q601
Q602
Focus Servo
Q603
Q604
Tracking Servo
IC601 CXA1372S
RF Signal Processing and Servo control
RFI
FEO
TAO
SLO
SSTOP
FCK
DFCT
XRST
LOCK
EFM
IC401 CXD2500AQ
XTAI
Digital Signal Processor
FCK
LOCK
SCOR
SQSO
SQCK
MD2
SENS
XRST
DATA
XLAT
CLOCK
RF
MON
DATA
SHIFT
LATCH
BCLK
DATA
LRCK
WFCK
SCOR
SBSO
EXCK
MAG. EJECT DRIVE Q891~894
Power Supply Section
Q101~Q1044
Q111~Q113
Q121~Q123
Q131~Q133
D101
D103~D106
D111~D114
D121~D124
D131~D133
D151~D153
±5V OFF
MUTE ON
F1
F2
-Vdisp
ENN-306-5
FW102
FW102
FW104
FW104
OFF
ON
POWER
ENN-306-7
Feed Motor
Spindle Motor
PU REST SW
FW803
IC602 STA341M
8
2
Feed Servo
7
3
IC802 VC4580L
Spindle Servo
JAB
Q822
MECHA VERTICAL CONTROL
IC804
5
6
7
FRONT
BACK
Q821
3
2
1
4
IC804
IC602
6
MAG. EJECT DRIVE Q891~894
P1.LOADING DRIVE Q871 ~ Q874 IC871
ENN-304-1
FW802
FW801
FW831
TRAY LOAD SW S805
DISC SW S806
VERTICAL MOTOR
HORIZONTAL MOTOR
MAGAZIN EJECT
JAB SW S803
MAGAZINE IN SW S802
MECHA REST SW S804
SLIT DETECT
S801 OPEN/CLOSE SW
P1 LOADING MOTOR

■ Graphics Section


P302
P303
MIC
MIC SN
IC901
DI
SDSY
BCI
CDL
CS
DO
L/R
BCO
KARAOKE
PROCESSOR
MIC
IC304
LC3517BS-15
16K S.RAM
CH0~CH3
M.MUTE
G.MUTE
ERROR CORRECTION
CPU
IC303
RESET
HD6301 YORAV3P
BC
A0~A14
MDO~MD11
CE,RW
IC902
HM6526BSP-10
256KS-RAM
IC302 LH2464-12
256 DRAM
IC365
CP
BFP
CSYNC
CRT CONTROL
IC301
VC4117 (Gate Array)
DT0~5,WE
A,B,C,PWR,SWR
RESET
MCLK
INTER
VD
HD
CROMKY
12V
8V
TO RF UNIT
FW301
FW301
J302
ENN-306-8
R
G
B
CSYNC
CP
BFP
VIDEO
ENCODER
IC307
BA7230LS
V OUT
BURST
LEVEL
V IN
B-Y OUT
B-Y IN
APC
R-Y OUT
R-Y IN
Carrier
PLL
YS
VIDEO
OUT
VIDEO
IN
D0~D7
DIV 2
Carrier PLL
D301
L302
IC312
Q310,Q311
SBSO
EXCK
SCOR
WFCK
RESET
I/F
IC305
VC4118(GATE Array)
XI
BC CROMKY
VIDEO
/RGB
SELECT
IC309~IC311
YS
ON
SUPER IMPOSE
OFF
X301
3.58M
IC903
L.P.F
IC904
BUFFER
IC905
BUFFER
D903
D904
D905
D906
Q902
VOCAL
LIMIT
Q903,Q904
Q901
IC905
HEAD AMP
IC905
HEAD AMP
IC906
IC906
VOCAL
DIT
MICSN
ENN-306-3
MIC 1
VOL
FW903
ENN-306-4
MIC 2
VOL
FW902
FW903
FW902
MIC 1
MIC 2
FW901
ENN-306-2
KEY +
KEY—
FW904
FW904
ECHO
VOL.
ENN-306-4
IC309
INT/NONINT
DIT
TC74HC123AP
IC365
MONO
MULTI
TC74HC123AP
HD
VD
IC306
SYNC SEP.
M52684AP
VIN
X303
500kHz

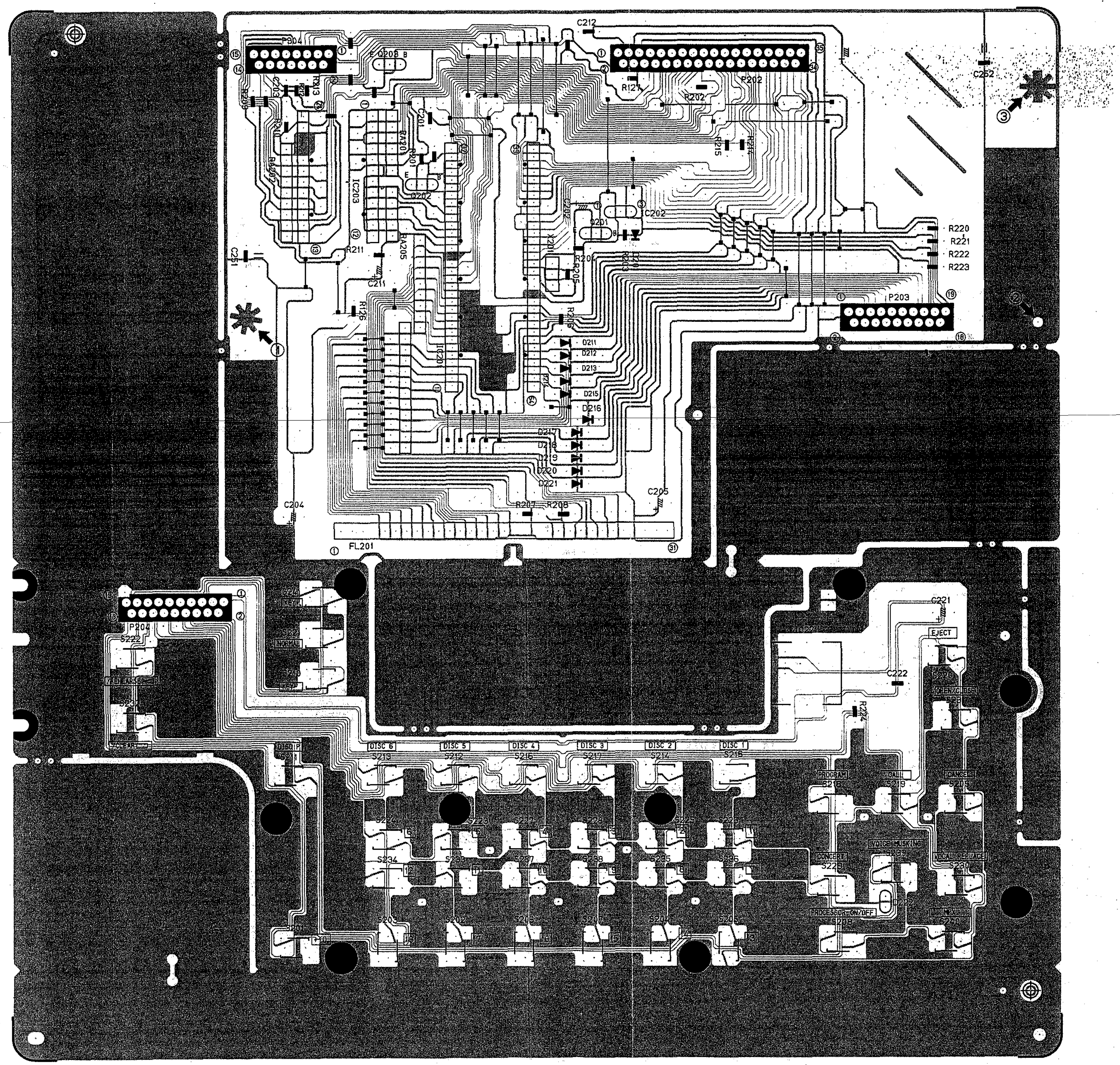
Printed Circuit Boards

■ Main P.C.Board (ENN-304)


IC401
IC501
IC602
IC604
IC702
IC703
IC705
IC706
IC707
P101
P201
P301
P501
P502
J701
X701
FW801
FW802
FW803
FW804
Q701
Q741

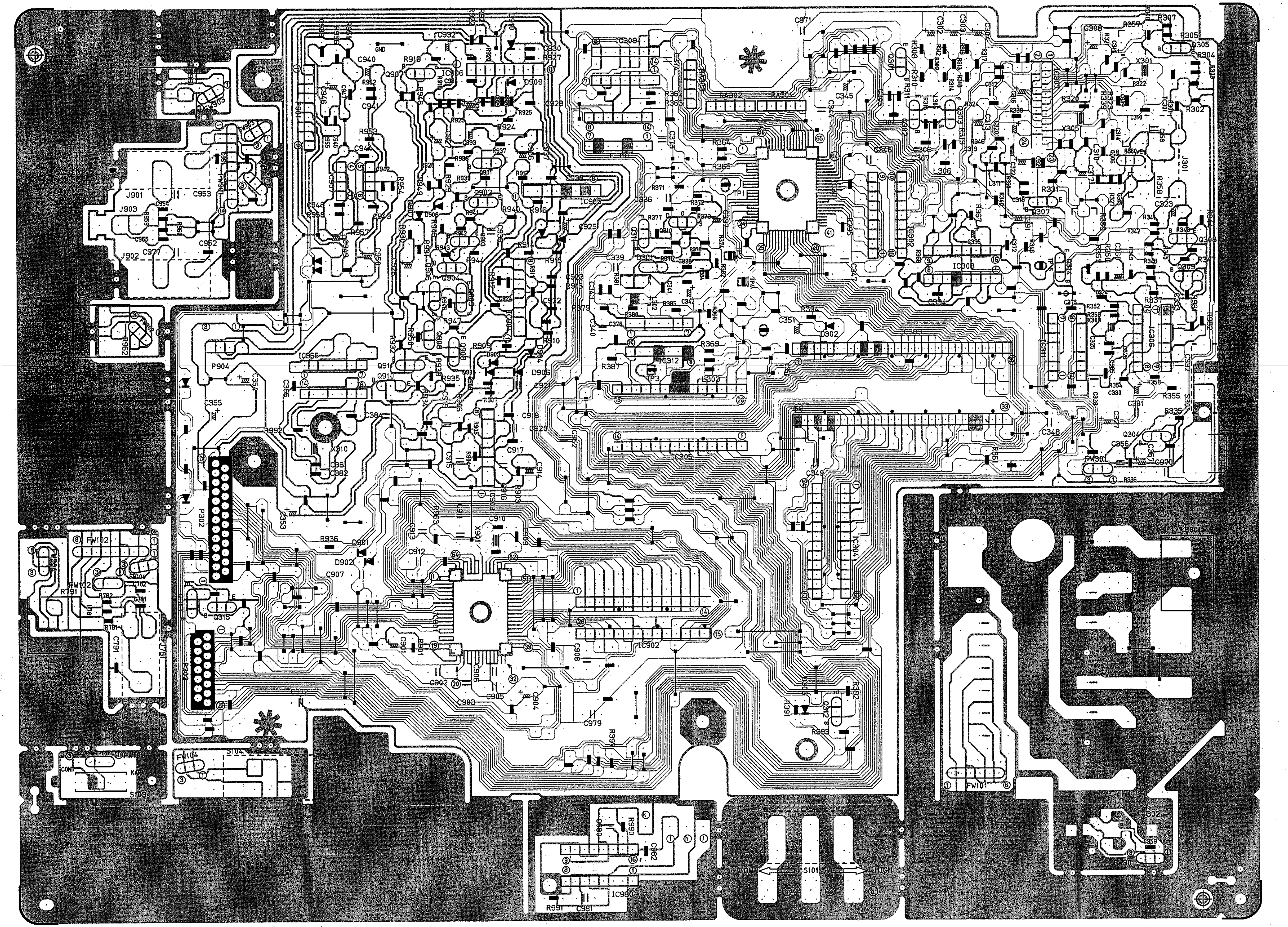
EMW10163-101
ENN-304

■ FL & Micro-computer P.C.Board (ENN-305)


P204
P202
P203
P204
C212
C252
C251
C202
C204
C205
C211
C221
C222
Q202
Q203
Q201
IC201
IC203
R127
R126
R202
R211
R214
R215
R220
R221
R222
R223
R207
R208
D211
D212
D213
D215
D216
D217
D218
D219
D220
D221
FL201
EJECT
DISC 6
DISC 5
DISC 4
DISC 3
DISC 2
DISC 1
S213
S212
S215
S217
S217
S218
S224
S225
S222
③
①
②

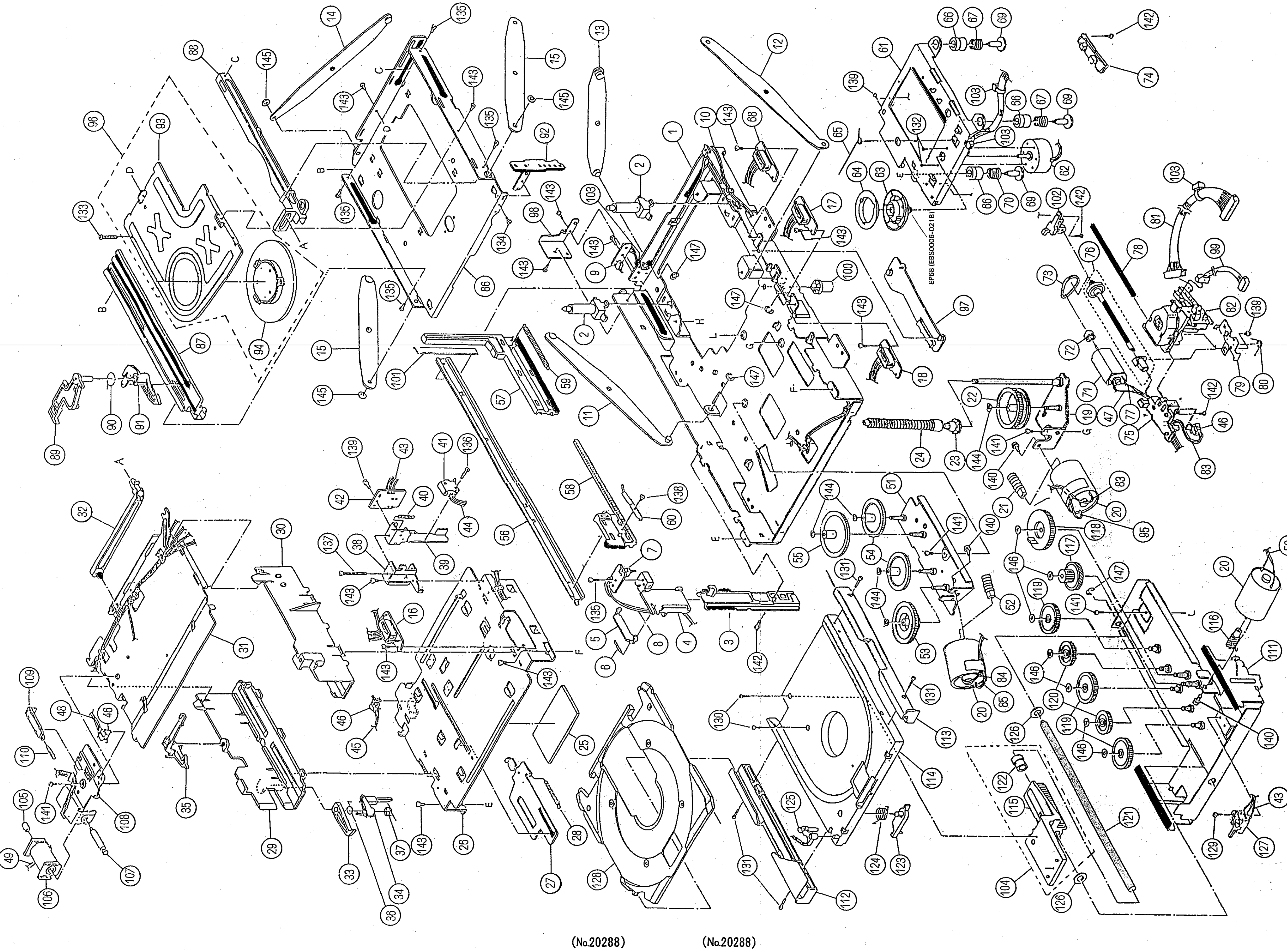
EMW10164-101
ENN-305

■ Graphics P.C.Board (ENN-306)


IC901
IC902
IC303
IC305
IC306
IC308
IC309
IC312
IC905
IC906
IC980
J901
J902
J903
J301
P302
P303
P904
FW101
FW102
FW104
S101
S104
X301
X310
X901
TP1
TP3

ENN-306
EMW10165-101

Exploded View of Assenblies and Application Points for Grease.


14
135
88
145
143
15
13
12
66
67
69
142
61
139
103
74
96
93
92
1
10
68
65
132
2
64
63
62
EP68 (EBS0006-021B)
133
134
98
9
147
17
100
70
102
81
86
97
73
76
78
99
82
94
87
101
57
59
11
18
72
71
47
77
75
46
79
80
89
90
91
22
19
144
141
140
24
23
83
20
95
21
118
117
146
119
58
138
60
7
56
43
41
136
42
40
44
32
30
137
38
39
16
5
8
4
3
6
31
55
54
53
51
52
131
84
85
50
116
111
109
48
45
25
128
130
113
114
126
120
110
105
108
35
29
33
36
34
37
26
27
28
124
123
125
112
122
115
121
104
129
127
49
106
107
A
B
C
D
E
F
G
H
J

EP68 (EBS0006-021B)

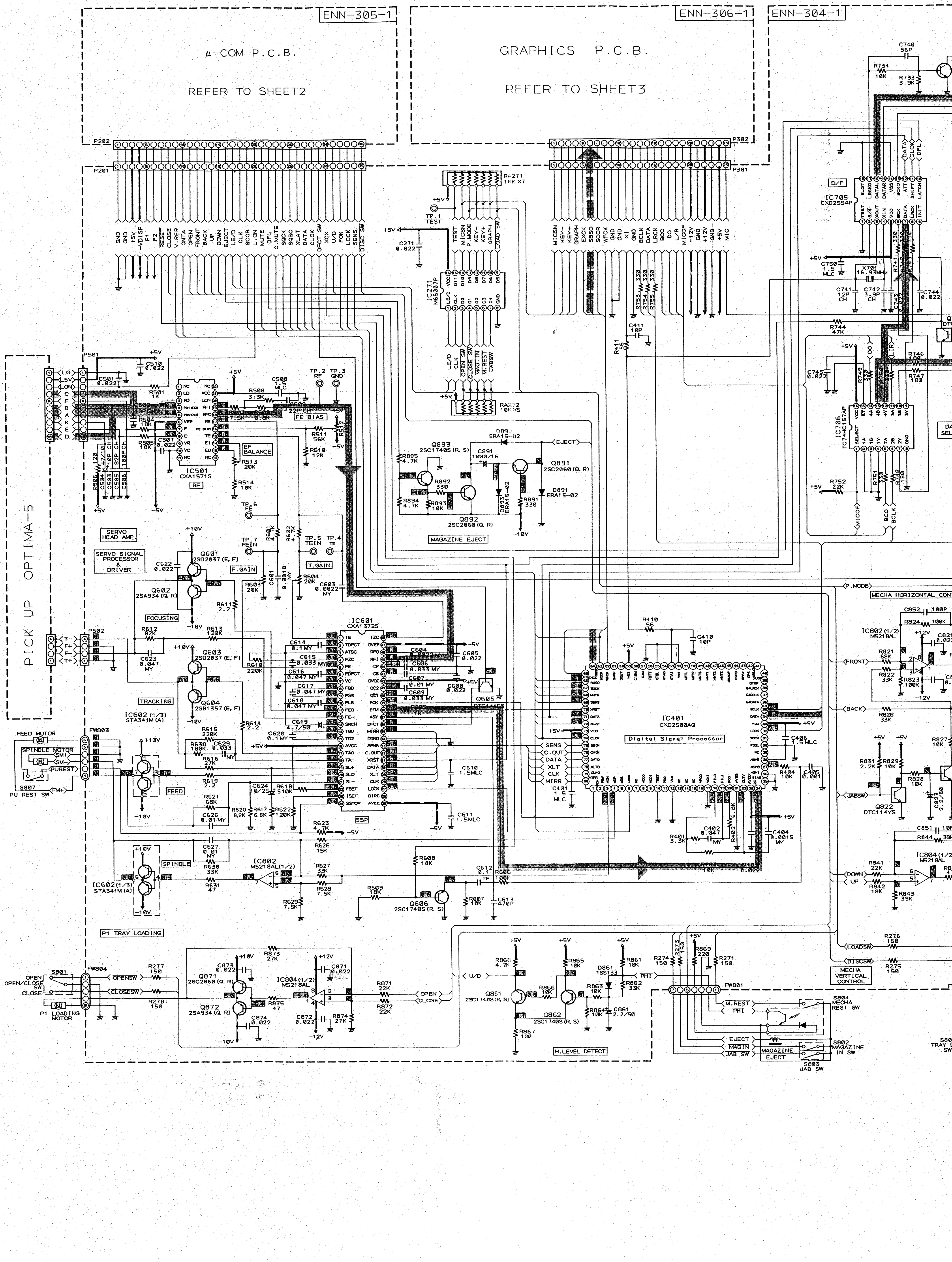
▇ G-425A

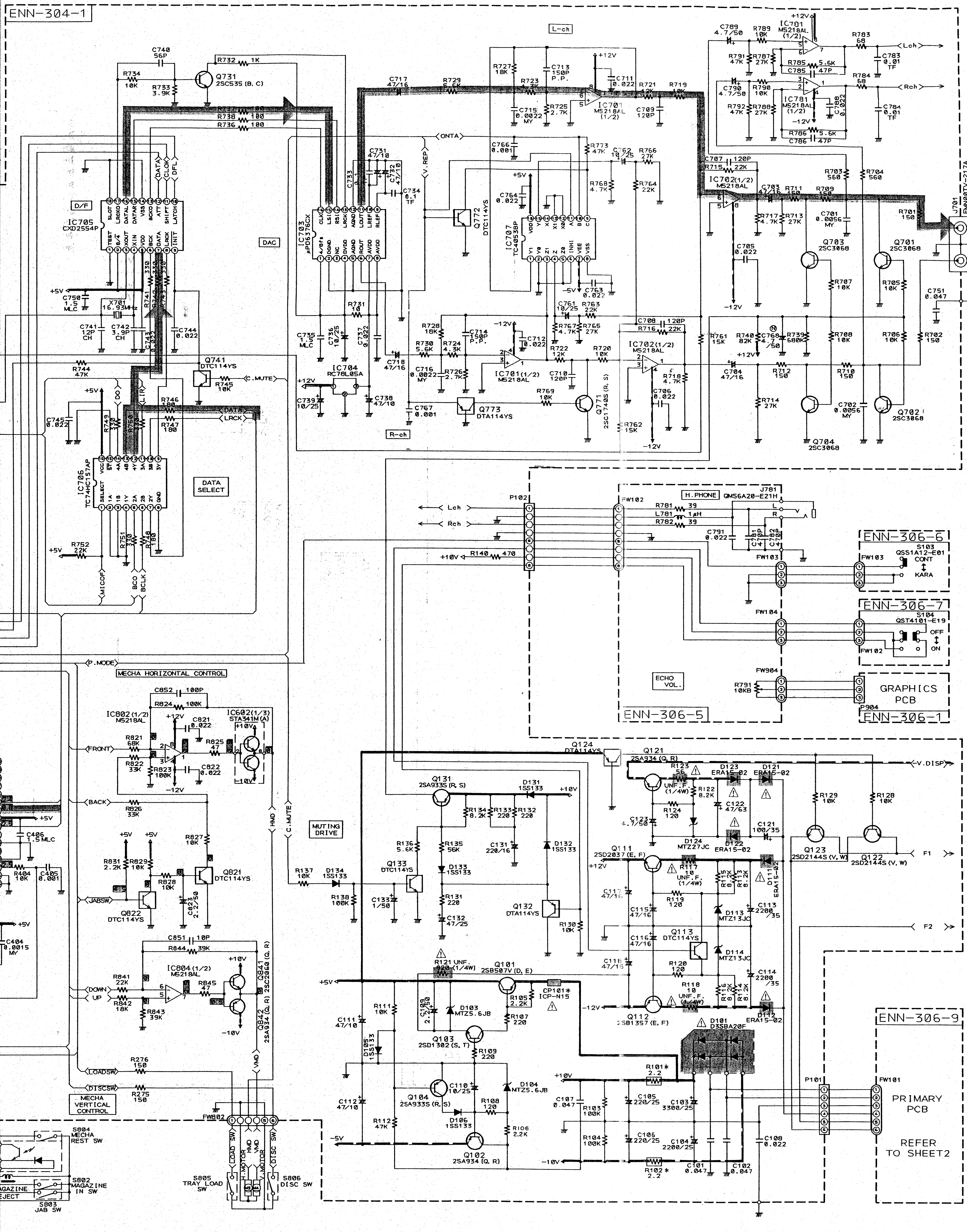
▇ G-488M

░ G-474C

SCHEMATIC DIAGRAM

■ Main P.C.Board Section

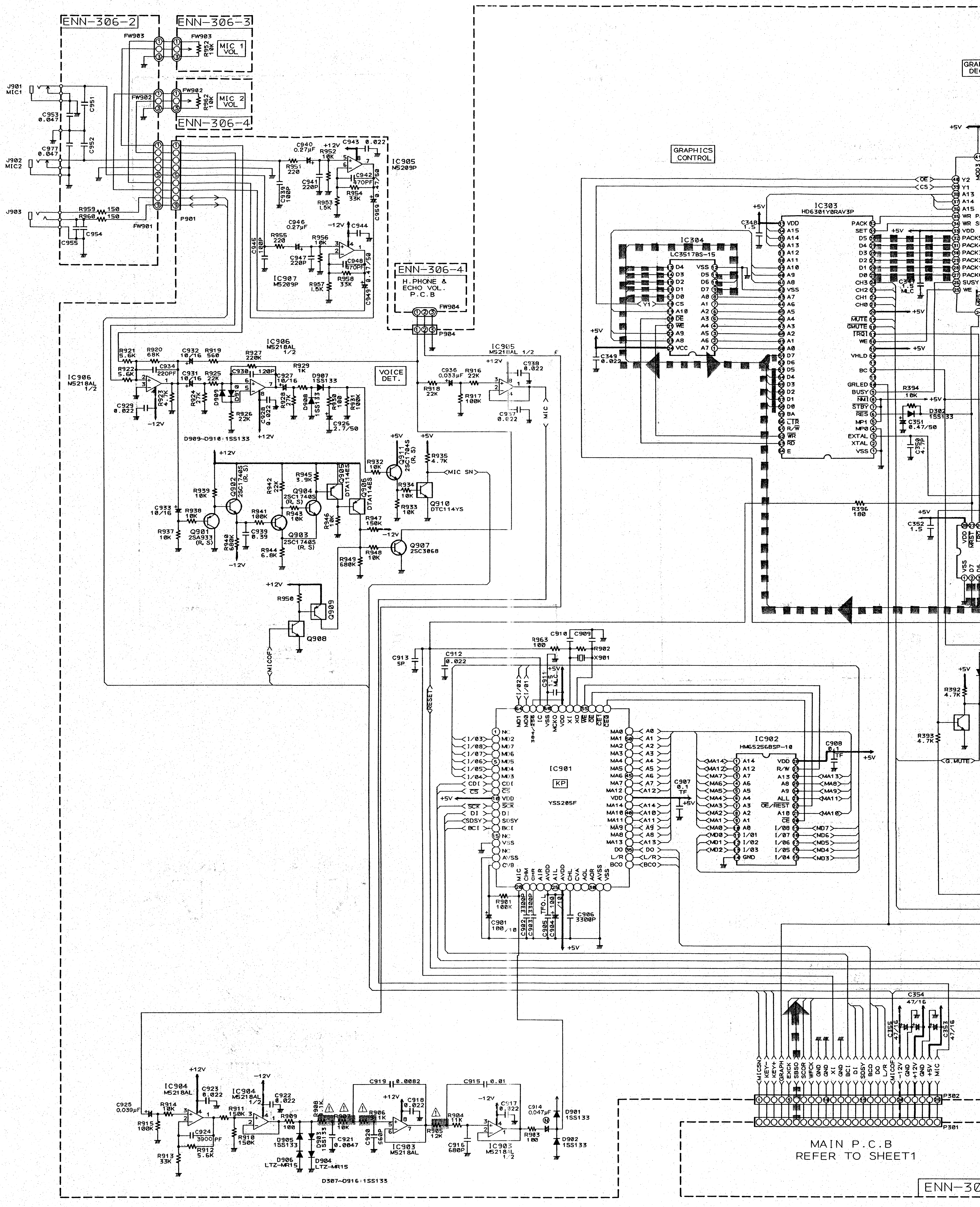

ENN-305-1
μ-COM P.C.B.
REFER TO SHEET2
ENN-306-1
GRAPHICS P.C.B.
REFER TO SHEET3
ENN-304-1
P202
P201
P302
P301
RA271 10K X7
TP.1 TEST
C271 0.022
IC271 M66007P
RA272 10K X5
PICK UP OPTIMA-5
P501
P502
IC501 CXA1571S
RF
EF BALANCE
FE BIAS
TP.2 RF
TP.3 GND
TP.6 FE
TP.7 FEIN
TP.5 TEIN
TP.4 TE
F.GAIN
T.GAIN
SERVO HEAD AMP.
SERVO SIGNAL PROCESSOR & DRIVER
Q601 2SD2037 (E, F)
Q602 2SA934 (Q, R)
FOCUSING
Q603 2SD2037 (E, F)
Q604 2SB1357 (E, F)
TRACKING
IC602 (1/3) STA341M (A)
FEED
IC601 CXA1372S
SSP
Q605 DTC144ES
SPINDLE
IC802 M5218AL(1/2)
Q606 2SC1740S (R, S)
IC602(1/3) STA341M (A)
P1 TRAY LOADING
FEED MOTOR
SPINDLE MOTOR
S807 PU REST SW
FW803
FW804
S801 OPEN/CLOSE SW
P1 LOADING MOTOR
Q871 2SC2060 (Q, R)
Q872 2SA934 (Q, R)
IC804(1/2) M5218AL
Q893 2SC1740S (R, S)
Q891 2SC2060 (Q, R)
Q892 2SC2060 (Q, R)
D891 ERA15-02
D892 ERA15-02
D893 ERA15-02
MAGAZINE EJECT
IC401 CXD2500AQ
Digital Signal Processor
IC705 CXD2554P
D/F
X701 16.93MHz
IC706 TC74HC157AP
IC802(1/2) M5218AL
MECHA HORIZONTAL CONT
Q822 DTC114YS
IC804(1/2) M5218AL
MECHA VERTICAL CONTROL
Q861 2SC1740S (R, S)
Q862 2SC1740S (R, S)
D861 1SS133
H.LEVEL DETECT
FW801
S804 MECHA REST SW
S802 MAGAZINE IN SW
S803 JAB SW

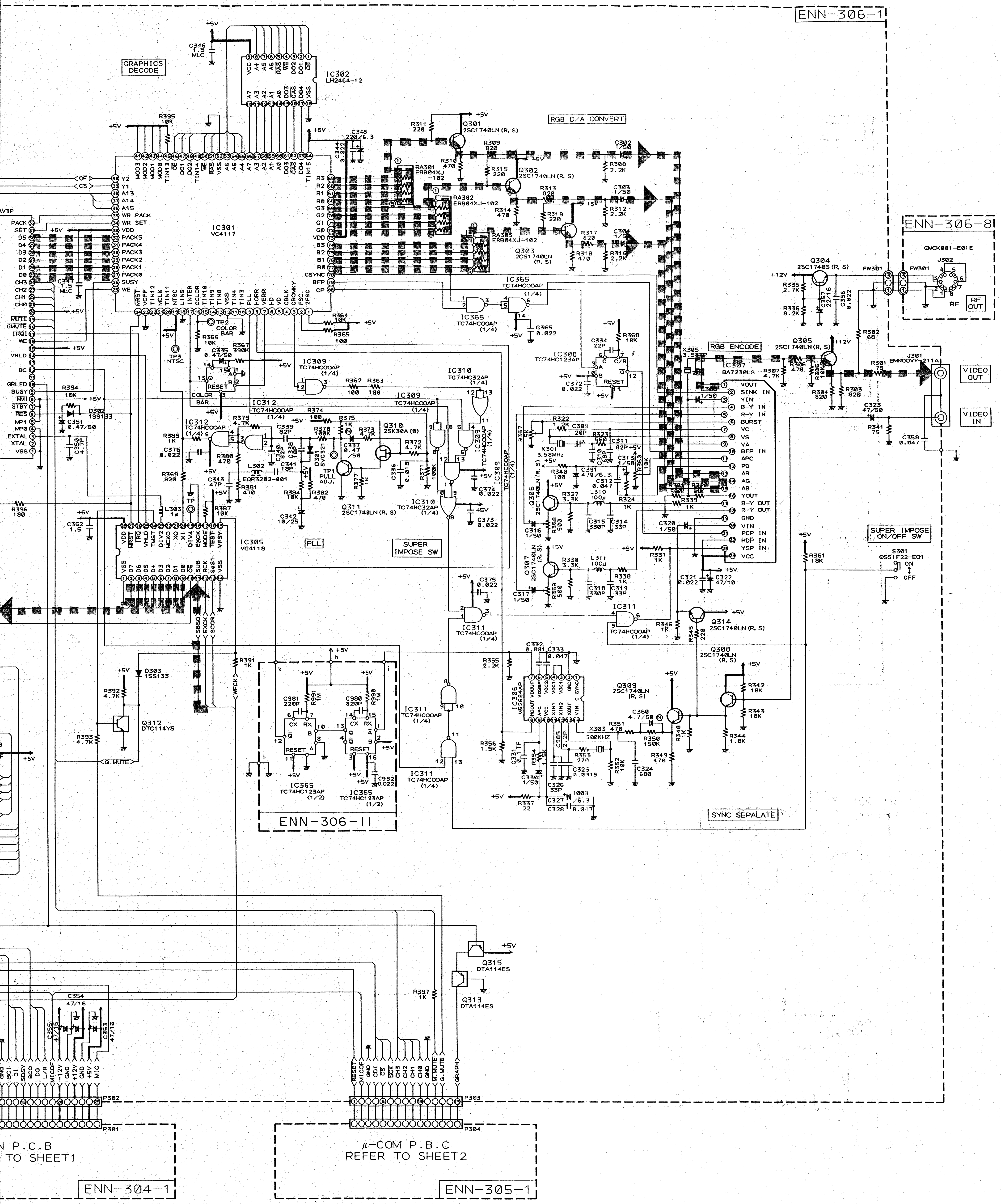

ENN-304-1
L-ch
R-ch
D/F
DAC
IC705 CXD2554P
IC703 μPD6376CX
IC704 RC78L05A
IC707 TC4053BP
IC706 TC74HC157AP
DATA SELECT
IC701 M5218AL
IC702 M5218AL
IC781 M5218AL
Q731 2SC535 (B, C)
Q741 DTC114YS
Q772 DTC114YS
Q773 DTA114YS
Q771 2SC1740S (R, S)
Q701 2SC3068
Q702 2SC3068
Q703 2SC3068
Q704 2SC3068
X701 16.93MHz
J701 EMN00TV-217A
Lch
Rch
ONTA
V.REP
C.MUTE
DATA
LRCK
MICOF
BCO
BCLK
P.MODE
MECHA HORIZONTAL CONTROL
IC802 (1/2) M5218AL
IC602 (1/3) STA341M (A)
IC804 (1/2) M5218AL
Q821 DTC114YS
Q822 DTC114YS
Q841 2SC2060 (Q, R)
Q842 2SA934 (Q, R)
FRONT
BACK
JABSW
DOWN
UP
LOADSW
DISCSW
MECHA VERTICAL CONTROL
FW802
S804 MECHA REST SW
S802 MAGAZINE IN SW
S803 JAB SW
S805 TRAY LOAD SW
S806 DISC SW
MAGAZINE EJECT
LOAD SW
H.MOTOR
HMD
VMD
V.MOTOR
DISC SW
MUTING DRIVE
P102
FW102
H.PHONE
J781 QMS6A20-E21H
ENN-306-6
S103 QSS1A12-E01
CONT
KARA
FW103
ENN-306-7
S104 QST4101-E19
OFF
ON
FW104
FW102
ECHO VOL.
ENN-306-5
FW904
R791 10KB
GRAPHICS PCB
P904
ENN-306-1
Q124 DTA114YS
Q121 2SA934 (Q, R)
V.DISP
Q131 2SA933S (R, S)
Q133 DTC114YS
Q132 DTA114YS
Q111 2SD2037 (E, F)
Q112 2SB1357 (E, F)
Q113 DTC114YS
Q123 2SD2144S (V, W)
Q122 2SD2144S (V, W)
Q101 2SB507V (D, E)
Q103 2SD1302 (S, T)
Q104 2SA933S (R, S)
Q102 2SA934 (Q, R)
D101 D3SBA20F
CP101* ICP-N15
R101* 2.2
R102* 2.2
F1
F2
ENN-306-9
P101
FW101
PRIMARY PCB
REFER TO SHEET2

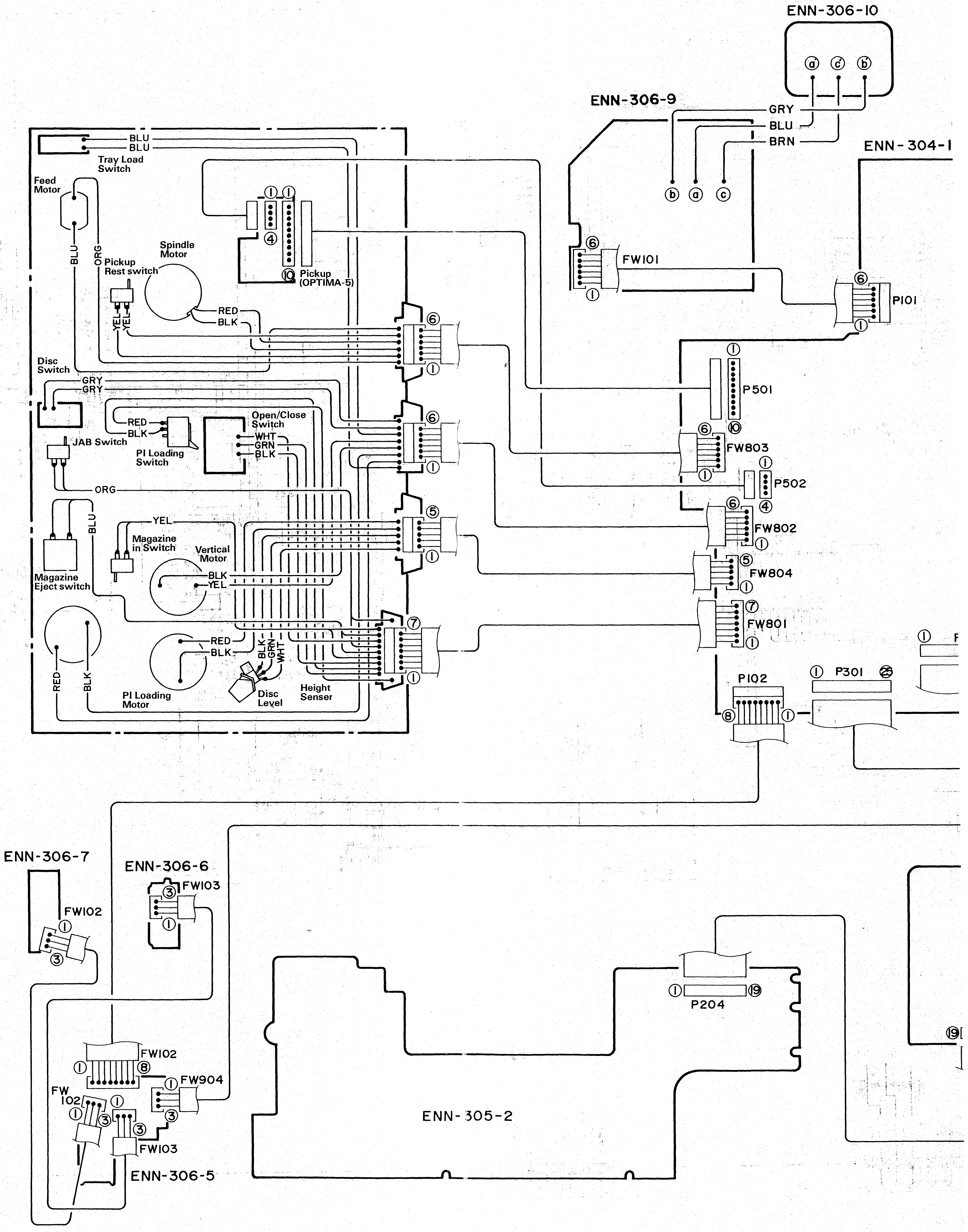
* MARK

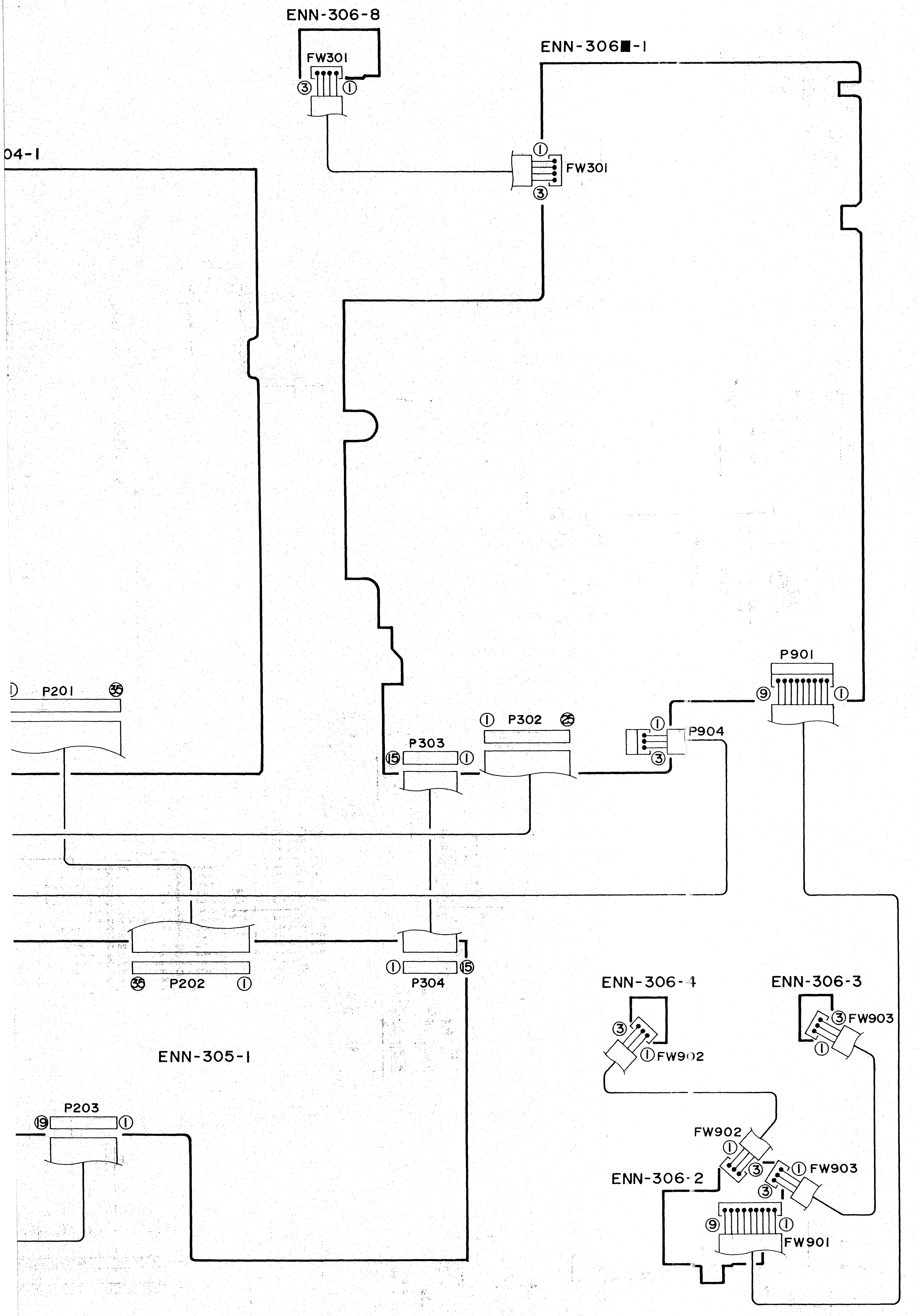
	J	C	U
CP101	SHORT	USED	USED
R101	SHORT	USED	USED
R102	SHORT	USED	USED

■ Graphics P.C.Board Section

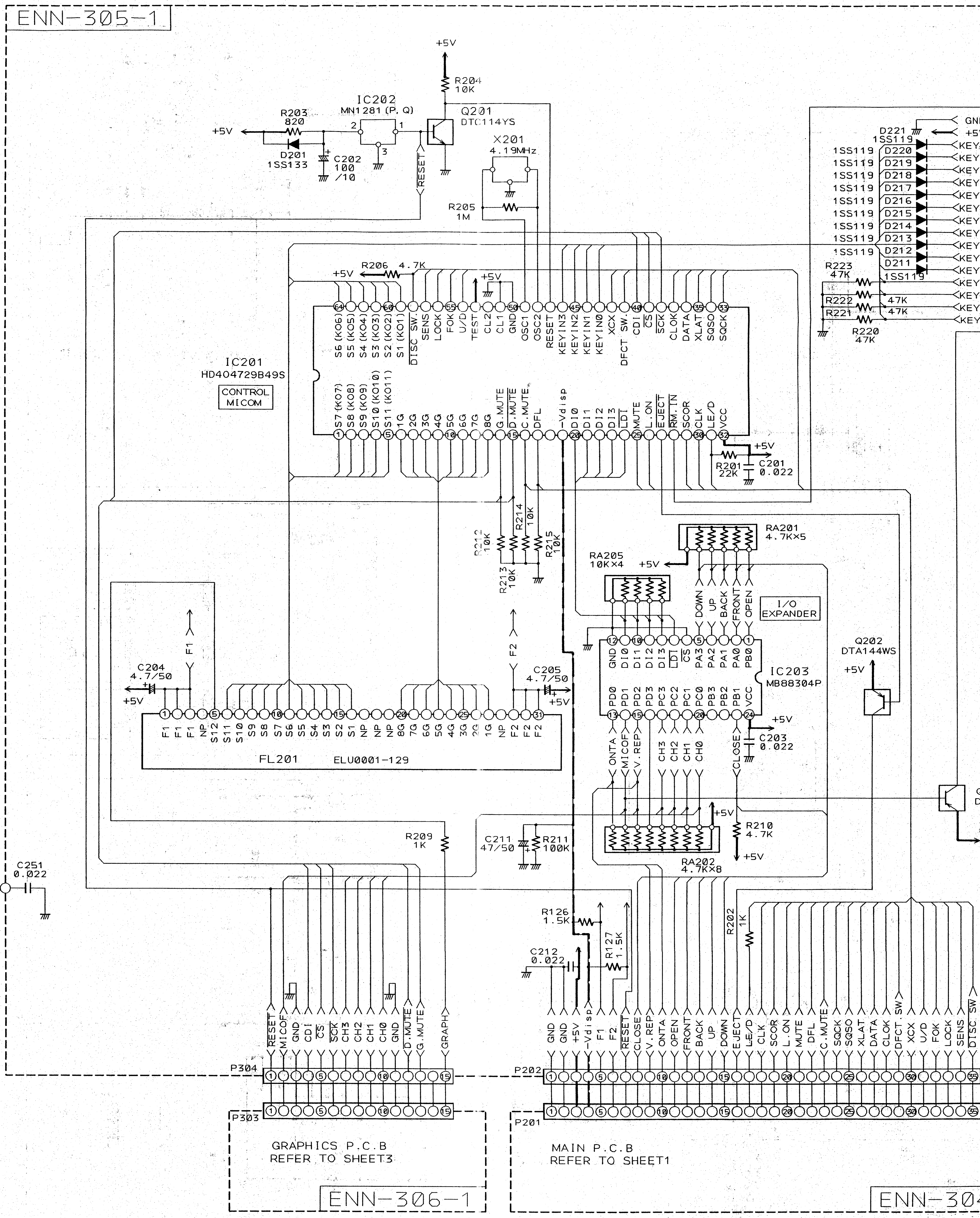

ENN-306-2
ENN-306-3
ENN-306-4
MIC 1 VOL
MIC 2 VOL
FW903
FW902
FW901
FW904
J901 MIC1
J902 MIC2
J903
P901
P904
IC905 M5209P
IC907 M5209P
ENN-306-4
H.PHONE & ECHO VOL. P.C.B
IC906 M5218AL 1/2
IC905 M5218AL 1/2
VOICE DET.
D909~D910:1SS133
MIC SN
MIC
Q901 2SA933 (R,S)
Q902 2SC1740S (R,S)
Q903 2SC1740S (R,S)
Q904 2SC1740S (R,S)
Q905 DTA114ES
Q906 DTA114ES
Q907 2SC3068
Q908
Q909
Q910 DTC114YS
Q911 2SC1740S (R,S)
MICOF
RESET
GRAPHICS CONTROL
IC303 HD6301Y0RAV3P
IC304 LC3517BS-15
IC901
KP
YSS205F
IC902 HM652568SP-10
X901
G.MUTE
IC904 M5218AL
IC904 M5218AL 1/2
IC903 M5218AL
IC903 M5218AL 1/2
D307~D916:1SS133
D905 1SS133
D906 LTZ-MR15
D903 1SS133
D904 LTZ-MR15
D901 1SS133
D902 1SS133
MICSN
KEY+
KEY-
GRAPH
EXCK
SBSO
SCOR
WFCK
GND
X1
DI
SDSY
BCO
DO
L/R
MICOF
-12V
GND
+12V
+5V
MIC
P302
P301
MAIN P.C.B
REFER TO SHEET1
ENN-30

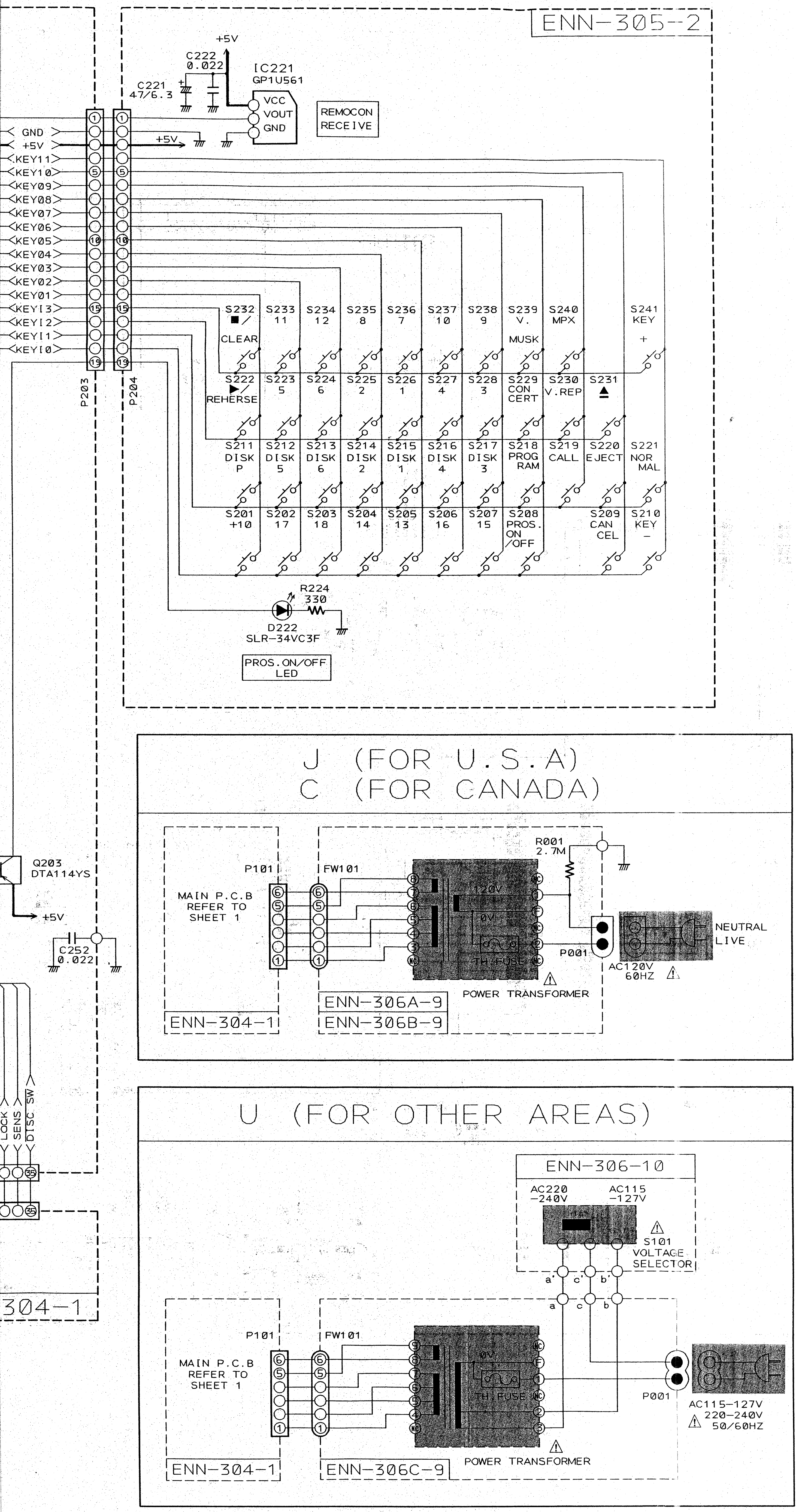

ENN-306-1
GRAPHICS DECODE
IC302 LH2464-12
IC301 VC4117
RGB D/A CONVERT
Q301 2SC1740LN (R, S)
Q302 2SC1740LN (R, S)
Q303 2CS1740LN (R, S)
RA301 ERB04XJ-102
RA302 ERB04XJ-102
RA303 ERB04XJ-102
ENN-306-8
QMCK001-E01E
J302
FW301
RF OUT
Q304 2SC1740S (R, S)
Q305 2SC1740LN (R, S)
RGB ENCODE
IC307 BA7230LS
X305 3.58MHz
J301 EMN00VY-211A
VIDEO OUT
VIDEO IN
IC365 TC74HC00AP (1/4)
IC309 TC74HC00AP (1/4)
IC310 TC74HC32AP (1/4)
IC312 TC74HC00AP (1/4)
IC308 TC74HC123AP
Q310 2SK30A (0)
Q311 2SC1740LN (R, S)
D301 SVC321
TP1 PULL ADJ.
L302 EQR3202-001
TP2 COLOR BAR
TP3 NTSC
PLL
SUPER IMPOSE SW
IC305 VC4118
X301 3.58MHz
Q306 2SC1740LN (R, S)
Q307 2SC1740LN (R, S)
SUPER IMPOSE ON/OFF SW
S301 QSS1F22-E01
ON
OFF
IC311 TC74HC00AP (1/4)
Q314 2SC1740LN (R, S)
Q308 2SC1740LN (R, S)
Q309 2SC1740LN (R, S)
IC306 M52084AP
X303 500KHZ
SYNC SEPALATE
ENN-306-11
IC365 TC74HC123AP (1/2)
D303 1SS133
D302 1SS133
Q312 DTC114YS
G.MUTE
Q315 DTA114ES
Q313 DTA114ES
C354 47/16
C355 47/16
C353 47/16
P302
P301
P303
P304
N P.C.B
TO SHEET1
ENN-304-1
μ-COM P.B.C
REFER TO SHEET2
ENN-305-1


ENN-306-10
ⓐ ⓒ ⓑ
ENN-306-9
GRY
BLU
BRN
ⓑ ⓐ ⓒ
ENN-304-1
FW101
⑥
①
P101
⑥
①
BLU
BLU
Tray Load Switch
Feed Motor
BLU
ORG
Pickup Rest switch
Spindle Motor
① ①
④
⑩ Pickup (OPTIMA-5)
RED
BLK
YEL
YEL
⑥
①
Disc Switch
GRY
GRY
RED
BLK
PI Loading Switch
Open/Close Switch
WHT
GRN
BLK
⑥
①
JAB Switch
ORG
BLU
Magazine Eject switch
YEL
Magazine in Switch
Vertical Motor
BLK
YEL
⑤
①
RED
BLK
RED
BLK
PI Loading Motor
BLK
GRN
WHT
Disc Level
Height Senser
⑦
①
①
P501
⑩
⑥
FW803
①
①
P502
④
⑥
FW802
①
⑤
FW804
①
⑦
FW801
①
P102
⑧
①
① P301 ㉕
①
ENN-306-7
FW102
①
③
ENN-306-6
FW103
③
①
①
P204
⑲
ENN-305-2
FW102
①
⑧
FW904
①
③
FW 102
①
③
①
③
FW103
ENN-306-5
⑲


ENN-306-8
FW301
③
①
ENN-306■-1
①
FW301
③
04-1
① P201 ㉟
P901
⑨
①
① P302 ㉕
P303
⑮
①
①
P904
③
⑮
① ⑮
㉟ P202 ①
P304
ENN-306-4
ENN-306-3
③
①FW902
③FW903
①
ENN-305-1
P203
⑲ ①
FW902
①
③
①FW903
ENN-306-2
③
⑨
①
FW901

■ Front P.C.Board Section


ENN-305-1
+5V
R204
10K
IC202
MN1281(P, Q)
Q201
DTC114YS
R203
820
D201
1SS133
C202
100
/10
RESET
X201
4.19MHz
R205
1M
R206 4.7K
IC201
HD404729B49S
CONTROL
MICOM
S6 (KO6)
S5 (KO5)
S4 (KO4)
S3 (KO3)
S2 (KO2)
S1 (KO1)
DISC SW.
SENS
LOCK
FOK
U/D
TEST
CL2
CL1
GND
OSC1
OSC2
RESET
KEYIN3
KEYIN2
KEYIN1
KEYIN0
XCX
DFCT SW.
CDI
CS
SCK
CLOK
DATA
XLAT
SQSO
SQCK
S7 (KO7)
S8 (KO8)
S9 (KO9)
S10 (KO10)
S11 (KO11)
1G
2G
3G
4G
5G
6G
7G
8G
G.MUTE
D.MUTE
C.MUTE
DFL
-Vdisp
DI0
DI1
DI2
DI3
LDT
MUTE
L.ON
EJECT
RM.TN
SCOR
CLK
LE/D
VCC
R201
22K
C201
0.022
D221
1SS119
D220
D219
D218
D217
D216
D215
D214
D213
D212
D211
1SS119
R223
47K
R222
47K
R221
47K
R220
47K
GND
KEY
RA201
4.7K×5
RA205
10K×4
R212
10K
R213
10K
R214
10K
R215
10K
DOWN
UP
BACK
FRONT
OPEN
I/O
EXPANDER
GND
PA3
PA2
PA1
PA0
PB0
PD0
PD1
PD2
PD3
PC3
PC2
PC1
PC0
PB3
PB2
PB1
VCC
IC203
MB88304P
Q202
DTA144WS
C203
0.022
ONTA
MICOF
V.REP
CH3
CH2
CH1
CH0
CLOSE
R210
4.7K
RA202
4.7K×8
F1
F2
C204
4.7/50
C205
4.7/50
F1
F1
NP
S12
S11
S10
S9
S8
S7
S6
S5
S4
S3
S2
S1
NP
NP
8G
7G
6G
5G
4G
3G
2G
1G
NP
F2
F2
F2
FL201
ELU0001-129
R209
1K
C211
47/50
R211
100K
C251
0.022
R126
1.5K
R127
1.5K
C212
0.022
R202
1K
RESET
MICOF
GND
CDI
CS
SCK
CH3
CH2
CH1
CH0
GND
D.MUTE
G.MUTE
GRAPH
GND
GND
+5V
-Vdisp
F1
F2
RESET
CLOSE
V.REP
ONTA
OPEN
FRONT
BACK
UP
DOWN
EJECT
LE/D
CLK
SCOR
L.ON
MUTE
DFL
C.MUTE
SQCK
SQSO
XLAT
DATA
CLOK
DFCT.SW
XCX
U/D
FOK
LOCK
SENS
DISC SW
P304
P303
P202
P201
GRAPHICS P.C.B
REFER TO SHEET3
ENN-306-1
MAIN P.C.B
REFER TO SHEET1
ENN-30


ENN-305-2
+5V
C222
0.022
IC221
GP1U561
C221
47/6.3
VCC
VOUT
GND
REMOCON
RECEIVE
GND
+5V
KEY11
KEY10
KEY09
KEY08
KEY07
KEY06
KEY05
KEY04
KEY03
KEY02
KEY01
KEY13
KEY12
KEY11
KEY10
P203
P204
S232 ■/ CLEAR
S233 11
S234 12
S235 8
S236 7
S237 10
S238 9
S239 V. MUSK
S240 MPX
S241 KEY +
S222 ▶/ REHERSE
S223 5
S224 6
S225 2
S226 1
S227 4
S228 3
S229 CON CERT
S230 V.REP
S231 ⏏
S211 DISK P
S212 DISK 5
S213 DISK 6
S214 DISK 2
S215 DISK 1
S216 DISK 4
S217 DISK 3
S218 PROG RAM
S219 CALL
S220 EJECT
S221 NOR MAL
S201 +10
S202 17
S203 18
S204 14
S205 13
S206 16
S207 15
S208 PROS. ON /OFF
S209 CAN CEL
S210 KEY −
R224
330
D222
SLR-34VC3F
PROS.ON/OFF LED
Q203
DTA114YS
+5V
C252
0.022
LOCK
SENS
DISC SW
35
304-1
J (FOR U.S.A)
C (FOR CANADA)
P101
FW101
MAIN P.C.B REFER TO SHEET 1
R001
2.7M
120V
0V
TH.FUSE
NC
F
P001
NEUTRAL
LIVE
AC120V
60HZ
POWER TRANSFORMER
ENN-306A-9
ENN-306B-9
ENN-304-1
U (FOR OTHER AREAS)
ENN-306-10
AC220 −240V
AC115 −127V
S101
VOLTAGE SELECTOR
a'
c'
b'
a
c
b
P101
FW101
MAIN P.C.B REFER TO SHEET 1
0V
TH.FUSE
P001
AC115−127V
220−240V
50/60HZ
POWER TRANSFORMER
ENN-304-1
ENN-306C-9

How to Use Schematic Diagrams

1. ——— indicates the +B line.
2. - - - - indicates the −B line.
3. ▨ indicates signal path.
4. ▬ ▬ ▬ Graphics signal path.
5. ▨ indicates voltage value.
6. Parts marked with ⚠ and those in the shaded area ▨ are parts for safety. Be sure to use one with the specified part number.
7. This is the standard circuit diagram. The circuits and circuit constants are subject to change for improvement without notice.

PARTS LIST

Contents

General Exploded View and Parts List 2-2
CD Changer Ass'y and Parts List 2-5
- How to install the gears and pulley when servicing 2-10
- How to install the Plus Gear C 2-11

Printed Circuit Board Ass'y and Parts List 2-12
- ENN-304 ☐ Main PC Board Ass'y 2-12
- ENN-306 ☐ Graphics PC Board Ass'y 2-16
- ENN-305 [A] FL & Micro-computer PC Board Ass'y 2-20

Accessories List 2-22
Packing Materials and Part Numbers 2-23

General Exploded View and Parts List

■ Parts List

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-XLGM800TNUS	Front Panel Ass'y	1		
	1-1	E102475-001	Front Panel	1		
	1-2	E307647-001	Window Screen	1		
	1-3	E72968-001	JVC Mark	1		
	2	SBSG3006M	Screw	6		
	3	SBSG3006Z	Screw	7		
	4	E307653-001	Headphone Bracket	1		
	5	E307649-001	Stay Bracket	1	Left	
	6	SBST3006Z	Screw	4		
	7	E75016-006	Volume Knob	3		
	8	E75563-003	Slide Knob	1		
	9	E406684-001	Power Button	1		
	10	SDSF2608Z	Screw	11		
	11	E307650-001	Stay Bracket	1	Center	
	12	E307652-001	Mic Volume Bracket	1		
	13	E307651-001	Stay Bracket	1	Right	
	14	E25834-010	Metal Cover	1		
	15	EXO010010H05S	Spacer	3		
	16	E406308-001	Special Screw	4	for Metal Cover (Side)	
	17	E73273-006	Special Screw	12		
	18	E306805-036	Spacer	1		
	19	E48729-009	Plastic Rivet	1		
	20	GBSG3008CC	Screw	10		
	21	EWR1KE-24TT	Flat Wire	1	19Pin	
	22	E406084-002	Fastener	1		
	23	E102384-007	Chassis Base	1		
	24	E406472-001	Foot Ass'y	4		
	25	SBST3008Z	Screw	4	for Foot	
	26	E307273-001	Bracket	1		
	27	SBST3004Z	Screw	3		
	28	E306232-001	Fastener	1		
	29	E306232-004	Fastener	2		
	30	E307645-001	Fitting	1		
	31	————	CD Changer Mechanism Unit Ass'y	1	See page 2-5	
	32	E406507-001	Caution Label	1		C, U
	33	E3400-301	Spacer	1		
⚠	34	ETP1000-76JA	Power Transformer	1		J, C
⚠		ETP1000-76LA	Power Transformer	1		U
	35	E65389-004	Special Screw	2		
	36	E406813-001	Spacer	1		
	37	EWR115K-20TT	Flat Wire	1	15Pin	
	38	EWR1RE-10TT	Flat Wire	1	25Pin	
	39	E406084-003	Fastener	1		
	40	EWR135K-14TT	Flat Wire	1	35Pin	
	41	E207187-001	Rear Panel	1		J, C
		E207187-002	Rear Panel	1		U
	—	E25536-071	Rating Label	1		J
	42	E306805-042	Spacer	1		
	43	SDSF2608M	Screw	2		U
	—	E61029-005	Number Label	1		C, U
	—	QZL1001-001	UL Label	1		J
	—	E45858-002	CSA Label	1		C
	—	E70891-001	Class 1 Label	1		U

The Marks for Designated Areas

⚠ Safety Parts

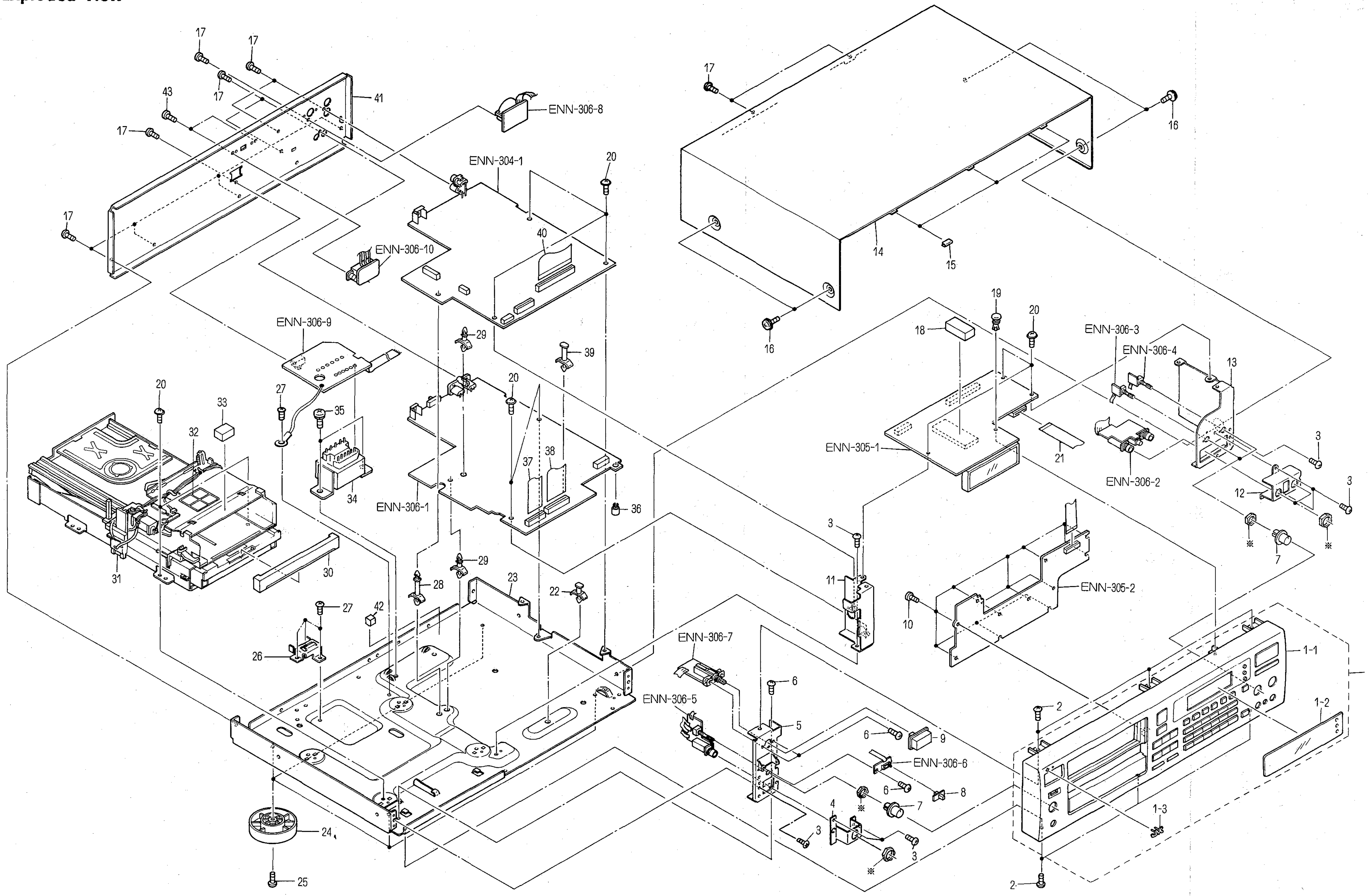
J……………………the U.S.A.

C……………………Canada

U……………………Universal Type

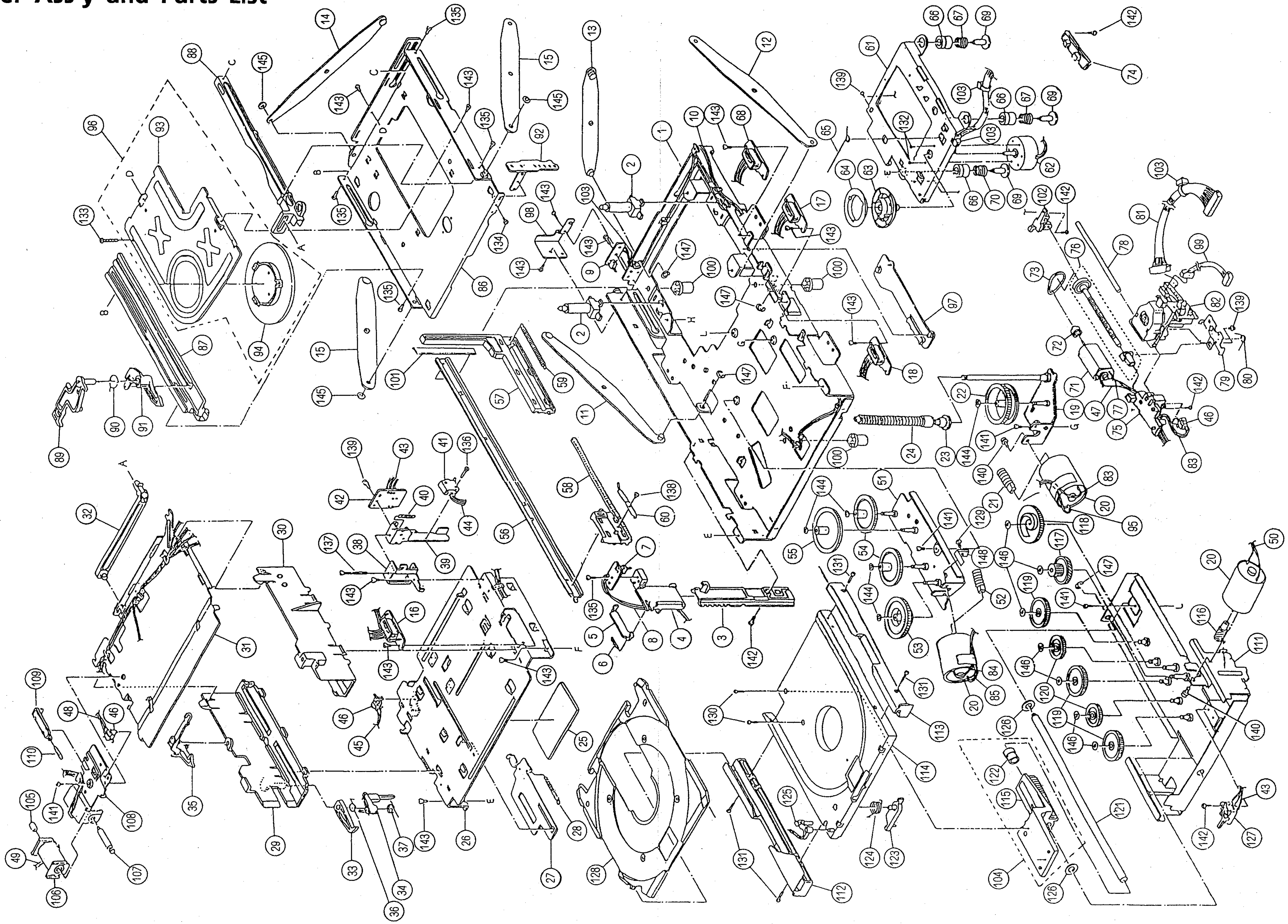
No mark indicates all areas.

■ Exploded View


17
17
17
43
17
41
17
ENN-306-8
ENN-304-1
20
40
ENN-306-10
17
16
14
15
16
ENN-306-9
29
39
20
27
35
33
32
34
37
38
ENN-306-1
36
31
30
29
28
23
22
27
42
26
24
25
18
19
20
ENN-306-3
ENN-306-4
13
ENN-305-1
21
ENN-306-2
3
12
3
※
7
※
3
11
ENN-305-2
10
1-1
1
ENN-306-7
6
ENN-306-5
5
6
9
ENN-306-6
6
7
8
※
4
3
3
※
2
1-2
1-3
2

※mark indicates attached part.

CD Changer Ass'y and Parts List


14
135
15
13
12
66
67
69
142
74
61
139
88
145
143
145
135
92
1
10
143
68
65
103
66
67
69
96
93
C
D
B
A
135
134
86
98
143
2
103
143
9
147
100
17
143
64
63
62
66
70
69
102
142
103
81
133
94
15
135
145
101
57
59
2
H
L
G
147
100
147
97
73
76
78
99
82
139
87
B
89
90
91
11
F
147
143
18
72
71
79
80
142
22
19
47
77
75
46
83
100
23
24
144
141
140
21
83
20
95
139
43
41
136
42
40
44
39
58
138
60
56
A
32
30
137
38
143
7
135
5
6
8
4
3
142
E
144
55
51
141
129
148
118
117
146
147
20
50
54
144
131
52
119
141
J
116
111
53
16
143
F
31
143
25
84
85
20
146
120
119
146
140
109
48
46
110
141
108
105
107
49
106
46
45
35
29
33
37
143
26
E
27
28
128
130
131
113
114
125
131
112
124
123
126
122
115
104
126
121
142
127
43
34
36

■ Parts List

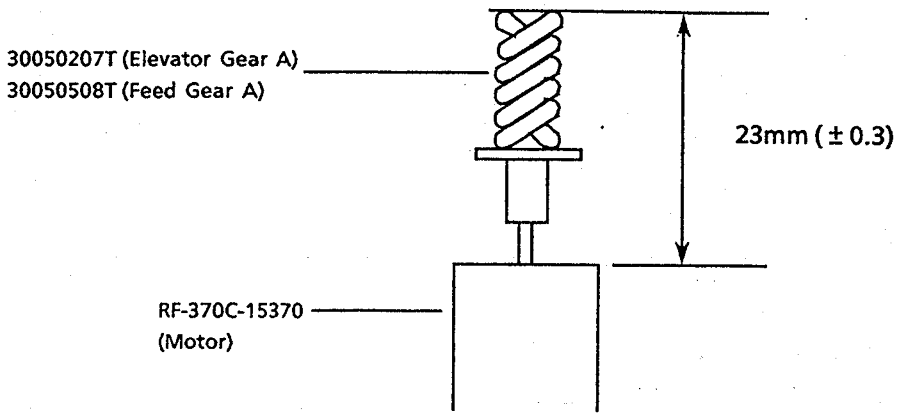
Item	Part Number	Part Name	Q'ty	Description	Areas
1	30050118T	Chassis Base	1		
2	30050115T	Guide Boss	2		
3	30051016T	Tray Switch Guide	1		
4	30050105T	Tray Switch Bracket	1		
5	30050106T	Sensor	1		
6	30050107T	Sensor Spring	1		
7	300501301T	Detect Switch PC Board Ass'y	1		
8	30051022T	Wire	2	Gray	
9	300505301T	FR. Detect PC Board Ass'y	1		
10	30051008T	Wire	2	Blue	
11	300502501T	Elevator Side Arm A	1	Left	
12	300502502T	Elevator Side Arm A	1	Right	
13	300502503T	Elevator Rear Arm A	1		
14	300502504T	Elevator Rear Arm B	1		
15	300502505T	Elevator Side Arm B	2		
16	300501302T	Connector PC Board A Ass'y	1		
17	300501304T	Connector PC Board D Ass'y	1		
18	300504301T	Connector PC Board P Ass'y	1		
19	300502507T	Elevator Motor Bracket	1		
20	RF-370C-15370	Motor	3		
21	30050207T	Elevator Gear A	1		
22	30050223T	Elevator Gear B	1		
23	30050219T	Elevator Gear C1	1		
24	30050220T	Elevator Gear C2	1		
25	30050432T	Disk Guard Mat	1		
26	30050327T	Guide Base	1		
27	30050423T	Elevator Slide lever	1		
28	30050333T	Elevator Slide Lever Spring	1		
29	30050302T	Magazine Guide	1	Left	
30	30050303T	Magazine Guide	1	Right	
31	30050304T	Guide Cover	1		
32	30050309T	Tray Stopper	1		
33	30050429T	Open Lever 1	1		
34	30050430T	Open Lever 2	1		
35	30050421T	Lock Lever	1		
36	30050431T	Open Lever Spring	1		
37	30050322T	Open Lever Spring	1		
38	30050323T	Switch Bracket	1		
39	30050319T	Switch Holder	1		
40	11521001T	Switch Holder Spring	1		
41	64020404T	SSCTL. Shorting Switch	1		
42	300503301T	Switch PC Board Ass'y	1		
43	30051025T	Wire	2		
44	30051024T	Wire	1		
45	30051021T	Wire	1		
46	64020403T	Push Switch	3		
47	30051007T	Wire	1	Orange	
48	30051019T	Wire	1		
49	30051020T	Wire	1		
50	30051023T	Wire	1		
51	300505502T	Feed Motor Bracket	1		
52	30050508T	Feed Gear A	1		
53	30050509T	Feed Gear B	1		
54	30050511T	Feed Gear D	2		
55	30050512T	Feed Gear E	1		
56	30050501T	Feed Rail	1		
57	30050518T	Hook Slide Lever	1		
58	30050503T	Rack Gear	1		
59	30050504T	Rack Gear Spring	1		
60	30050515T	Lock Spring Plate	1		

Item	Part Number	Part Name	Q'ty	Description	Areas
61	30050738T	Turn Table Base	1		
62	60020705T	Motor	1		
63	30050729T	Turn Table	1		
64	30050713T	Turn Table Plate	1		
65	30050742T	Controller Spring	1		
66	30050721T	Floating Rubber	3		
67	30050715T	Floating Spring (B)	2		
68	300501303T	Connector PC Board C Ass'y	1		
69	30050743T	Floating Screw	3		
70	30050740T	Floating Spring	1		
71	60021102T	Motor	1		
72	30050709T	Motor Pulley	1		
73	30050714T	Feed Motor Belt	1		
74	30050737T	Pick up Support	1		
75	30050724T	Shaft Holder A	1		
76	300507303T	Feed Screw As'y	1		
77	30051014T	Wire	1	Blue	
78	30050728T	Pick up Shaft	1		
79	30050735T	Feed Nut Holder	1		
80	30050739T	Feed Nut Spring	1		
81	EWS25A-B218	Wire	1	10P	
82	OPTIMA-5S	Pick up	1		
83	30051011T	Wire	3	Yellow	
84	30051009T	Wire	1	Black	
85	30051010T	Wire	1	Red	
86	300508502T	Rail Base Ass'y	1		
87	30050802T	Rail	1	left	
88	30050803T	Rail	1	Right	
89	30050804T	Hook Lever	1		
90	30050822T	Hook Spring	1		
91	30050820T	Hook	1		
92	30050440T	Switch Detect Plate C	1		
93	30050806T	Magnet Holder Bracket	1		
94	300508301T	Clamper Ass'y	1		
95	30051012T	Wire	1	Black	
96	300508303T	Magnet Holder Ass'y	1		
97	30051015T	Wire Protecter	1		
98	30050113T	Bracket	1		
99	EWS254-B222	Wire	1	4P	
100	30050114T	Chassis Support	1		
101	30050519T	Bracket	1		
102	30050725T	Shaft Holder B	1		
103	12030105T	Tie Band	11		
104	300504303T	Plus Base Guide Rack Ass'y	1		
105	30050445T	Plunger Holder	1		
106	300103302T	Coil Ass'y	1		
107	30050444T	Plunger	1		
108	30050448T	Solenoid Bracket	1		
109	30050420T	Switch Slide Lever	1		
110	30050447T	Switch Slide Lever Spring	1		
111	300504502T	Plus Base Ass'y	1		
112	30050402T	Plus Rail	1	Left	
113	30050403T	Plus Rail	1	Right	
114	30050435T	Plus Rail Base	1		
115	30050436T	Plus Base Guide Rack	1		
116	30050406T	Plus Gear A	1		
117	30050407T	Plus Gear B	1		
118	30050434T	Plus Gear C	1		
119	30050438T	Plus Gear D	3		
120	30050410T	Plus Gear E	2		

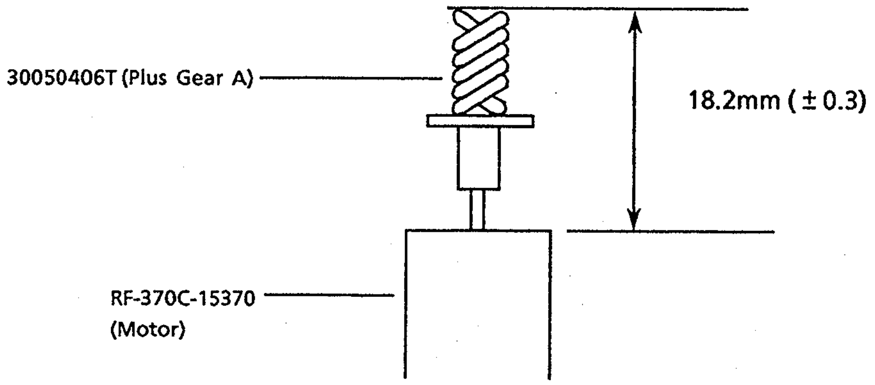
Item	Part Number	Part Name	Q'ty	Description	Areas
121	30050439T	Guide Shaft	1		
122	30050415T	Guide Rack Metal	1		
123	30050416T	Stopper	1		
124	30050417T	Stopper Spring	1		
125	30050418T	Plus Lock Lever	1		
126	30050425T	Absorbent Rubber	1		
127	MCV00240MPDO	Slide Switch	1		
128	E26609-001	Plus 1 Tray	1		
129	LPSP3005Z	Screw	1		
130	9P0720083T	Screw	2		
131	9P0720101T	Screw	4		
132	SPSK1722M	Screw	2		
133	SPSP2014Z	Screw	1		
134	SPSK2003M	Screw	1		
135	9C0820601T	Screw	5		
136	SPSK2008M	Screw	1		
137	9F2220321T	Screw	1		
138	9C2620251T	Screw	1		
139	LPSP2003Z	Screw	3		
140	LPSP3004Z	Screw	2		
141	9P1120032T	Screw	4		
142	9P0420051T	Screw	5		
143	9P0420041T	Screw	12		
144	WDM210540	Washer	5		
145	WDM300650	Washer	3		
146	9W0250110T	Washer	7		
147	REE3000	E.Ring	4		
148	30050520T	Reinforcement Bracket	1		

■ How to install the gears and pulley when servicing.

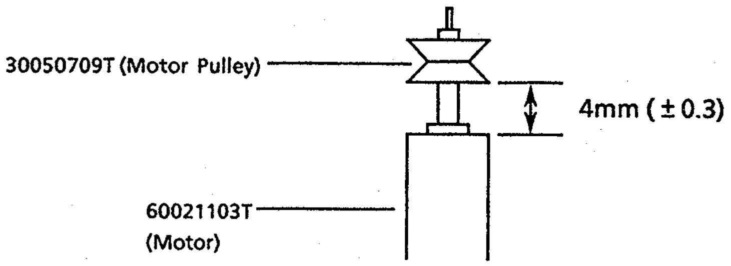
1. Elevator Motor, Loading Motor


30050207T (Elevator Gear A)
30050508T (Feed Gear A)
23mm (± 0.3)
RF-370C-15370
(Motor)

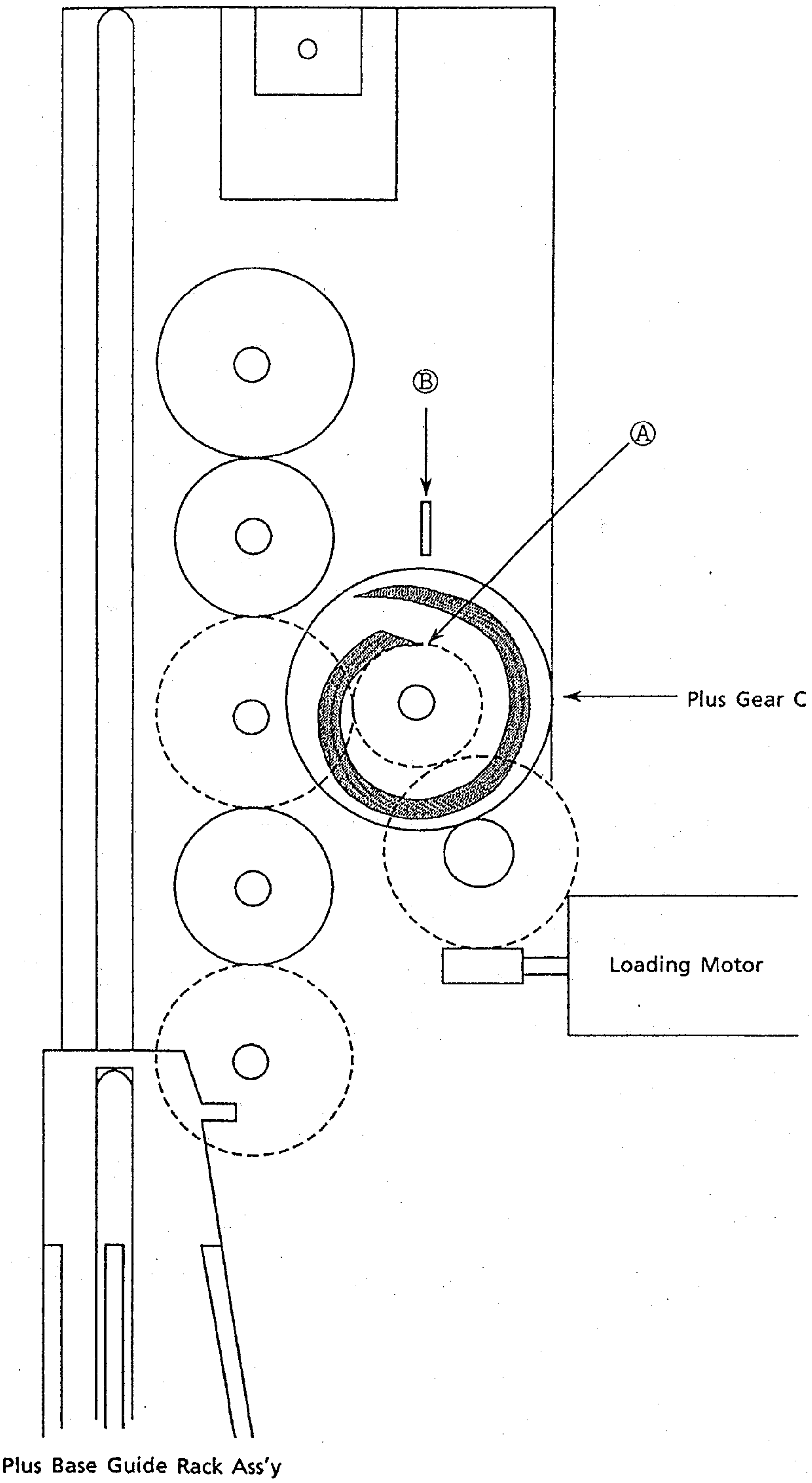
2. Loading Motor for single tray


30050406T (Plus Gear A)
18.2mm (± 0.3)
RF-370C-15370
(Motor)

3. Feed Motor


30050709T (Motor Pulley)
4mm (± 0.3)
60021103T
(Motor)

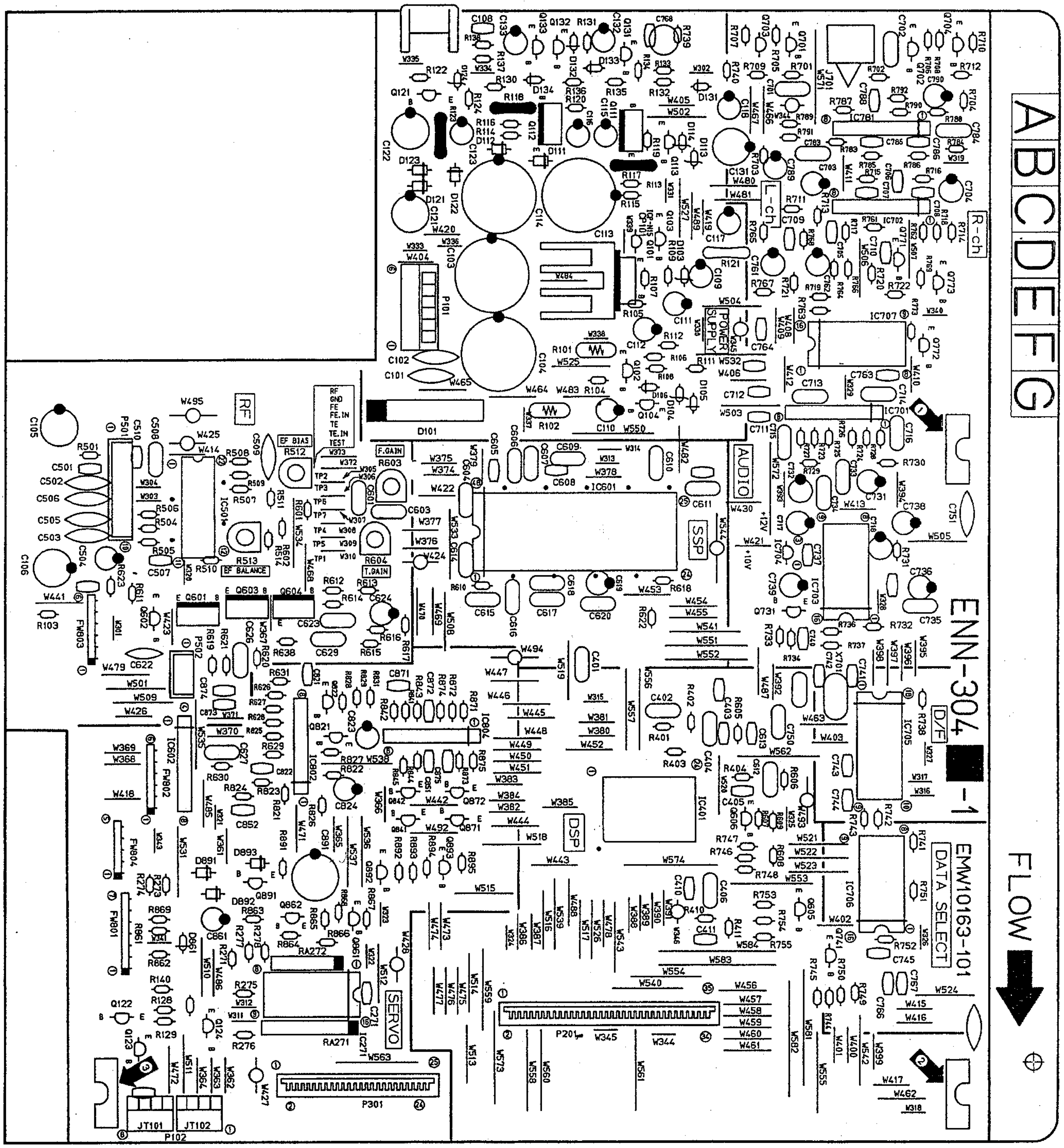
■ How to install the Plus Gear C.


Ⓑ
Ⓐ
Plus Gear C
Loading Motor
Plus Base Guide Rack Ass'y

Printed Circuit Board Ass'y and Parts List

■ENN-304☐ Main PC Board Ass'y

Note : ENN-304☐ varies according to the areas employed. See note (1) when placing an order.


A
B
C
D
E
F
G
R-ch
L-ch
POWER SUPPLY
AUDIO
SSP
DSP
SERVO
RF
D/F
DATA SELECT
EF BIAS
EF BALANCE
F.GAIN
T.GAIN
RF
GND
FE
FE.IN
TE
TE.IN
TEST
+12V
+10V
ENN-304■-1
EMW10163-101
FLOW
P101
P102
P201
P301
JT101
JT102
IC501
IC502
IC601
IC401
IC701
IC703
IC705
IC706
IC707
IC802
IC804
D101
FW801
FW802
FW803
FW804

Note(1)

PC Board Ass'y	Designated Areas
ENN-304 A	the U.S.A.
ENN-304 B	Canada
ENN-304 C	Universal Type

Transistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	Q101	2SB507V(D,E)	SILICON SANYO	
	Q102	2SA934(Q,R)	SILICON ROHM	
	Q103	2SD1302(S,T)	SILICON MATSUSHITA	
	Q104	2SA933S(R,S)	SILICON ROHM	
	Q111	2SD2037(E,F)	SILICON ROHM	
	Q112	2SB1357(E,F)	SILICON ROHM	
	Q113	DTC114YS	SILICON ROHM	
	Q121	2SA934(Q,R)	SILICON ROHM	
	Q122	2SD2144S(VW)	SILICON ROHM	
	Q123	2SD2144S(VW)	SILICON ROHM	
	Q124	DTA114YS	SILICON ROHM	
	Q131	2SA933S(R,S)	SILICON ROHM	
	Q132	DTA114YS	SILICON ROHM	
	Q133	DTC114YS	SILICON ROHM	
	Q601	2SD2037(E,F)	SILICON ROHM	
	Q602	2SA934(Q,R)	SILICON ROHM	
	Q603	2SD2037(E,F)	SILICON ROHM	
	Q604	2SB1357(E,F)	SILICON ROHM	
	Q605	DTC144ES	SILICON ROHM	
	Q606	2SC1740S(R,S)	SILICON ROHM	
	Q701	2SC3068	SILICON SANYO	
	Q702	2SC3068	SILICON SANYO	
	Q703	2SC3068	SILICON SANYO	
	Q704	2SC3068	SILICON SANYO	
	Q731	2SC535(B,C)	SILICON HITACHI	
	Q741	DTC114YS	SILICON ROHM	
	Q771	2SC1740S(R,S)	SILICON ROHM	
	Q772	DTC144ES	SILICON ROHM	
	Q773	DTA114YS	SILICON ROHM	
	Q821	DTC114YS	SILICON ROHM	
	Q822	DTC114YS	SILICON ROHM	
	Q841	2SC2060(Q,R)	SILICON ROHM	
	Q842	2SA934(Q,R)	SILICON ROHM	
	Q861	2SC1740S(R,S)	SILICON ROHM	
	Q862	2SC1740S(R,S)	SILICON ROHM	
	Q871	2SC2060(Q,R)	SILICON ROHM	
	Q872	2SA934(Q,R)	SILICON ROHM	
	Q891	2SC2060(Q,R)	SILICON ROHM	
	Q892	2SC2060(Q,R)	SILICON ROHM	
	Q893	2SC1740S(R,S)	SILICON ROHM	

⚠ : SAFETY PARTS

I.C.s

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	IC271	M66007P	I.C. MITSUBISHI	
	IC401	CXD2500AQ	I.C.	
	IC501	CXA1571S	I.C.	
	IC601	CXA1372S	I.C.	
	IC602	STA341M(A)	I.C. SANKEN	
	IC701	M5218AL	I.C. MITSUBISHI	
	IC702	M5218AL	I.C. MITSUBISHI	
	IC703	UPD6376CX	I.C. NEC	
	IC704	RC78L05A	I.C.	
	IC705	CXD2554P	I.C.	
	IC706	TC74HC157AP	I.C. TOSHIBA	
	IC707	TC4053BP	I.C. TOSHIBA	
	IC781	M5218AL	I.C. MITSUBISHI	
	IC802	M5218AL	I.C. MITSUBISHI	
	IC804	M5218AL	I.C. MITSUBISHI	

⚠ : SAFETY PARTS

Diodes

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	D101	D3SBA20F03	SI.DIODE SINDENGEN	
	D103	MTZ5.6JB	ZENER ROHM	
	D104	MTZ5.6JB	ZENER ROHM	
	D105	1SS133	SILICON ROHM	
	D106	1SS133	SILICON ROHM	
⚠	D111	ERA15-02L19	SILICON KYOUDOU	
⚠	D112	ERA15-02L19	SILICON KYOUDOU	
	D113	MTZ13JC	ZENER ROHM	
	D114	MTZ13JC	ZENER ROHM	
⚠	D121	ERA15-02L19	SILICON KYOUDOU	

⚠ : SAFETY PARTS

Diodes

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
⚠	D122	ERA15-02L19	SILICON KYOUDOU	
⚠	D123	ERA15-02L19	SILICON KYOUDOU	
	D124	MTZ27JC	ZENER ROHM	
	D131	1SS133	SILICON ROHM	
	D132	1SS133	SILICON ROHM	
	D133	1SS133	SILICON ROHM	
	D134	1SS133	SILICON ROHM	
	D861	1SS133	SILICON ROHM	
⚠	D891	ERA15-02L19	SILICON KYOUDOU	
⚠	D892	ERA15-02L19	SILICON KYOUDOU	
⚠	D893	ERA15-02L19	SILICON KYOUDOU	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C101	QCF21HP-473	0.047MF 50V CERAMIC	
	C102	QCF21HP-473	0.047MF 50V CERAMIC	
	C103	QETB1EM-338	3300MF 25V ELECTRO	
	C104	QETB1EM-228	2200MF 25V ELECTRO	
	C105	QETB1EM-227	220MF 25V ELECTRO	
	C106	QETB1EM-227	220MF 25V ELECTRO	
	C107	QCF21HP-473	0.047MF 50V CERAMIC	
	C108	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C109	QETB1HM-225	2.2MF 50V ELECTRO	
	C110	QETB1EM-106	10MF 25V ELECTRO	
	C111	QETB1AM-476	47MF 10V ELECTRO	
	C112	QETB1AM-476	47MF 10V ELECTRO	
	C113	QETB1VM-228N	2200MF 35V ELECTRO	
	C114	QETB1VM-228N	2200MF 35V ELECTRO	
	C115	QETB1CM-476	47MF 16V ELECTRO	
	C116	QETB1CM-476	47MF 16V ELECTRO	
	C117	QETB1CM-476	47MF 16V ELECTRO	
	C118	QETB1CM-476	47MF 16V ELECTRO	
	C121	QETB1VM-107	100MF 35V ELECTRO	
	C122	QETB1JM-476	47MF 63V ELECTRO	
	C123	QETB1HM-475	4.7MF 50V ELECTRO	
	C131	QETB1CM-227	220MF 16V ELECTRO	
	C132	QETB1EM-476	47MF 25V ELECTRO	
	C133	QETB1HM-105	1MF 50V ELECTRO	
	C271	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C401	QCZ0205-155	1.5MF 25V CERAMIC	
	C402	QFN81HJ-473	0.047MF 50V MYLAR	
	C403	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C404	QFN81HJ-152	1500PF 50V MYLAR	
	C405	QCGB1HK-102	1000PF 50V CERAMIC	
	C406	QCZ0205-155	1.5MF 25V CERAMIC	
	C410	QCSB1HJ-100	10PF 50V CERAMIC	
	C411	QCSB1HJ-100	10PF 50V CERAMIC	
	C501	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C502	QCT26CH-100	10PF 50V CERAMIC	
	C503	QCT26CH-100	10PF 50V CERAMIC	
	C504	QETB1AM-476	47MF 10V ELECTRO	
	C505	QCT26CH-820	82PF 50V CERAMIC	
	C506	QCT26CH-101	100PF 50V CERAMIC	
	C507	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C508	QCZ0205-155	1.5MF 25V CERAMIC	
	C509	QCT26CH-220	22PF 50V CERAMIC	
	C510	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C601	QFN81HJ-182	1800PF 50V MYLAR	
	C603	QFN81HJ-222	2200PF 50V MYLAR	
	C604	QFN81HJ-222	2200PF 50V MYLAR	
	C605	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C606	QFN81HJ-333	0.033MF 50V MYLAR	
	C607	QFN81HJ-103	0.01MF 50V MYLAR	
	C608	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C609	QFN81HJ-333	0.033MF 50V MYLAR	
	C610	QCZ0205-155	1.5MF 25V CERAMIC	
	C611	QCZ0205-155	1.5MF 25V CERAMIC	
	C612	QFV81HJ-104	0.1MF 50V T.FILM	
	C613	QCBB1HK-471	470PF 50V CERAMIC	
	C614	QFN81HJ-104	0.1MF 50V MYLAR	
	C615	QFN81HJ-333	0.033MF 50V MYLAR	
	C616	QFN81HJ-473	0.047MF 50V MYLAR	
	C617	QFN81HJ-473	0.047MF 50V MYLAR	
	C618	QFN81HJ-473	0.047MF 50V MYLAR	
	C619	QETB1HM-475	4.7MF 50V ELECTRO	
	C620	QFN81HJ-104	0.1MF 50V MYLAR	
	C623	QFN81HJ-473	0.047MF 50V MYLAR	
	C624	QETB1EM-106	10MF 25V ELECTRO	
	C626	QFN81HJ-103	0.01MF 50V MYLAR	
	C627	QFN81HJ-103	0.01MF 50V MYLAR	
	C629	QFN81HJ-333	0.033MF 50V MYLAR	
	C701	QFN81HJ-562	5600PF 50V MYLAR	
	C702	QFN81HJ-562	5600PF 50V MYLAR	
	C703	QETB1CM-476	47MF 16V ELECTRO	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C704	QETB1CM-476	47MF 16V ELECTRO	
	C705	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C706	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C707	QCBB1HK-121	120PF 50V CERAMIC	
	C708	QCBB1HK-121	120PF 50V CERAMIC	
	C709	QCBB1HK-121	120PF 50V CERAMIC	
	C710	QCBB1HK-121	120PF 50V CERAMIC	
	C711	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C712	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C713	QFP81HJ-151	150PF 50V POLY	
	C714	QFP81HJ-151	150PF 50V POLY	
	C715	QFN81HJ-222	2200PF 50V MYLAR	
	C716	QFN81HJ-222	2200PF 50V MYLAR	
	C717	QETB1CM-476	47MF 16V ELECTRO	
	C718	QETB1CM-476	47MF 16V ELECTRO	
	C731	QETB1AM-476	47MF 10V ELECTRO	
	C732	QETB1AM-476	47MF 10V ELECTRO	
	C733	QFV81HJ-104	0.1MF 50V T.FILM	
	C734	QFV81HJ-104	0.1MF 50V T.FILM	
	C735	QCZ0205-155	1.5MF 25V CERAMIC	
	C736	QETB1EM-106	10MF 25V ELECTRO	
	C737	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C738	QETB1AM-476	47MF 10V ELECTRO	
	C739	QETB1EM-106	10MF 25V ELECTRO	
	C740	QCSB1HJ-560	56PF 50V CERAMIC	
	C741	QCT30CH-120	12PF 50V CERAMIC	
	C742	QCT30CH-3R9	3.9PF 50V CERAMIC	
	C743	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C744	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C745	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C750	QCZ0205-155	1.5MF 25V CERAMIC	
	C751	QCF21HP-473	0.047MF 50V CERAMIC	
	C761	QETB1EM-106	10MF 25V ELECTRO	
	C762	QETB1EM-106	10MF 25V ELECTRO	
	C763	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C764	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C766	QCGB1HK-102	1000PF 50V CERAMIC	
	C767	QCGB1HK-102	1000PF 50V CERAMIC	
	C768	QEN51HM-475	4.7MF 50V NON POLE	
	C783	QFV81HJ-103	0.01MF 50V T.FILM	
	C784	QFV81HJ-103	0.01MF 50V T.FILM	
	C785	QCSB1HJ-470	47PF 50V CERAMIC	
	C786	QCSB1HJ-470	47PF 50V CERAMIC	
	C788	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C789	QETB1HM-475	4.7MF 50V ELECTRO	
	C790	QETB1HM-475	4.7MF 50V ELECTRO	
	C821	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C822	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C823	QETB1HM-225	2.2MF 50V ELEGTRO	
	C851	QCSB1HJ-100	10PF 50V CERAMIC	
	C852	QCBB1HK-101	100PF 50V CERAMIC	
	C861	QETB1HM-225	2.2MF 50V ELECTRO	
	C871	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C872	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C873	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C874	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C891	QETB1CM-108	1000MF 16V ELECTRO	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
⚠	R101	PTH61G30BD2R2N	FUSIBLE	B
⚠	R101	PTH61G30BD2R2N	FUSIBLE	C
⚠	R102	PTH61G30BD2R2N	FUSIBLE	B
⚠	R102	PTH61G30BD2R2N	FUSIBLE	C
	R103	QRD167J-104	100K 1/6W CARBON	
	R104	QRD167J-104	100K 1/6W CARBON	
	R105	QRD167J-222	2.2K 1/6W CARBON	
	R106	QRD167J-222	2.2K 1/6W CARBON	
	R107	QRD167J-221	220 1/6W CARBON	
	R108	QRD167J-121	120 1/6W CARBON	
	R109	QRD167J-221	220 1/6W CARBON	
	R111	QRD167J-103	10K 1/6W CARBON	
	R112	QRD167J-473	47K 1/6W CARBON	
	R113	QRD167J-822	8.2K 1/6W CARBON	
	R114	QRD167J-822	8.2K 1/6W CARBON	
	R115	QRD167J-822	8.2K 1/6W CARBON	
	R116	QRD167J-822	8.2K 1/6W CARBON	
⚠	R117	QRZ0077-100	10 1/4W FUSIBLE	
⚠	R118	QRZ0077-100	10 1/4W FUSIBLE	
	R119	QRD167J-121	120 1/6W CARBON	
	R120	QRD167J-121	120 1/6W CARBON	
⚠	R121	QRD14CJ-821S	820 1/4W UNF.CARBON	
	R122	QRD167J-822	8.2K 1/6W CARBON	
⚠	R123	QRZ0077-560	56 1/4W FUSIBLE	
	R124	QRD167J-121	120 1/6W CARBON	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	R128	QRD167J-103	10K 1/6W CARBON	
	R129	QRD167J-103	10K 1/6W CARBON	
	R130	QRD167J-103	10K 1/6W CARBON	
	R131	QRD167J-221	220 1/6W CARBON	
	R132	QRD167J-221	220 1/6W CARBON	
	R133	QRD167J-221	220 1/6W CARBON	
	R134	QRD167J-822	8.2K 1/6W CARBON	
	R135	QRD167J-563	56K 1/6W CARBON	
	R136	QRD167J-562	5.6K 1/6W CARBON	
	R137	QRD167J-103	10K 1/6W CARBON	
	R138	QRD167J-104	100K 1/6W CARBON	
	R140	QRD167J-471	470 1/6W CARBON	
	R271	QRD167J-151	150 1/6W CARBON	
	R273	QRD167J-151	150 1/6W CARBON	
	R274	QRD167J-151	150 1/6W CARBON	
	R275	QRD167J-151	150 1/6W CARBON	
	R276	QRD167J-151	150 1/6W CARBON	
	R277	QRD167J-151	150 1/6W CARBON	
	R278	QRD167J-151	150 1/6W CARBON	
	R401	QRD167J-332	3.3K 1/6W CARBON	
	R402	QRD167J-682	6.8K 1/6W CARBON	
	R403	QRD167J-103	10K 1/6W CARBON	
	R404	QRD167J-103	10K 1/6W CARBON	
	R410	QRD167J-560	56 1/6W CARBON	
	R411	QRD167J-560	56 1/6W CARBON	
	R501	QRD167J-102	1K 1/6W CARBON	
	R504	QRD167J-183	18K 1/6W CARBON	
	R505	QRD167J-183	18K 1/6W CARBON	
	R506	QRD167J-121	120 1/6W CARBON	
	R507	QRD167J-752	7.5K 1/6W CARBON	
	R508	QRD167J-332	3.3K 1/6W CARBON	
	R509	QRD167J-682	6.8K 1/6W CARBON	
	R510	QRD167J-123	12K 1/6W CARBON	
	R511	QRD167J-563	56K 1/6W CARBON	
	R512	QVPA601-203A	20K VARIABLE	
	R513	QVPA601-203A	20K VARIABLE	
	R514	QRD167J-103	10K 1/6W CARBON	
	R601	QRD167J-472	4.7K 1/6W CARBON	
	R602	QRD167J-472	4.7K 1/6W CARBON	
	R603	QVPA601-203A	20K VARIABLE	
	R604	QVPA601-203A	20K VARIABLE	
	R605	QRD167J-102	1K 1/6W CARBON	
	R606	QRD167J-104	100K 1/6W CARBON	
	R607	QRD167J-103	10K 1/6W CARBON	
	R608	QRD167J-183	18K 1/6W CARBON	
	R609	QRD167J-183	18K 1/6W CARBON	
	R610	QRD167J-224	220K 1/6W CARBON	
	R611	QRD167J-2R2	2.2 1/6W CARBON	
	R612	QRD167J-823	82K 1/6W CARBON	
	R613	QRD167J-124	120K 1/6W CARBON	
	R614	QRD167J-2R2	2.2 1/6W CARBON	
	R615	QRD167J-224	220K 1/6W CARBON	
	R616	QRD167J-273	27K 1/6W CARBON	
	R617	QRD167J-682	6.8K 1/6W CARBON	
	R618	QRD167J-514	510K 1/6W CARBON	
	R619	QRD167J-2R2	2.2 1/6W CARBON	
	R620	QRD167J-822	8.2K 1/6W CARBON	
	R621	QRD167J-683	68K 1/6W CARBON	
	R622	QRD167J-124	120K 1/6W CARBON	
	R623	QRD167J-472	4.7K 1/6W CARBON	
	R626	QRD167J-153	15K 1/6W CARBON	
	R627	QRD167J-333	33K 1/6W CARBON	
	R628	QRD167J-752	7.5K 1/6W CARBON	
	R629	QRD167J-752	7.5K 1/6W CARBON	
	R630	QRD167J-333	33K 1/6W CARBON	
	R631	QRD167J-470	47 1/6W CARBON	
	R638	QRD167J-184	180K 1/6W CARBON	
	R701	QRD167J-151	150 1/6W CARBON	
	R702	QRD167J-151	150 1/6W CARBON	
	R703	QRD167J-561	560 1/6W CARBON	
	R704	QRD167J-561	560 1/6W CARBON	
	R705	QRD167J-103	10K 1/6W CARBON	
	R706	QRD167J-103	10K 1/6W CARBON	
	R707	QRD167J-103	10K 1/6W CARBON	
	R708	QRD167J-103	10K 1/6W CARBON	
	R709	QRD167J-151	150 1/6W CARBON	
	R710	QRD167J-151	150 1/6W CARBON	
	R711	QRD167J-151	150 1/6W CARBON	
	R712	QRD167J-151	150 1/6W CARBON	
	R713	QRD167J-273	27K 1/6W CARBON	
	R714	QRD167J-273	27K 1/6W CARBON	
	R715	QRD167J-223	22K 1/6W CARBON	
	R716	QRD167J-223	22K 1/6W CARBON	
	R717	QRD167J-472	4.7K 1/6W CARBON	
	R718	QRD167J-472	4.7K 1/6W CARBON	
	R719	QRD167J-103	10K 1/6W CARBON	
	R720	QRD167J-103	10K 1/6W CARBON	
	R721	QRD167J-123	12K 1/6W CARBON	
	R722	QRD167J-123	12K 1/6W CARBON	
	R723	QRD167J-432	4.3K 1/6W CARBON	
	R724	QRD167J-432	4.3K 1/6W CARBON	
	R725	QRD167J-272	2.7K 1/6W CARBON	
	R726	QRD167J-272	2.7K 1/6W CARBON	
	R727	QRD167J-183	18K 1/6W CARBON	
	R728	QRD167J-183	18K 1/6W CARBON	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	R729	QRD167J-562	5.6K 1/6W CARBON	
	R730	QRD167J-562	5.6K 1/6W CARBON	
	R731	QRD167J-100	10 1/6W CARBON	
	R732	QRD167J-102	1K 1/6W CARBON	
	R733	QRD167J-392	3.9K 1/6W CARBON	
	R734	QRD167J-103	10K 1/6W CARBON	
	R736	QRD167J-101	100 1/6W CARBON	
	R737	QRD167J-101	100 1/6W CARBON	
	R738	QRD167J-101	100 1/6W CARBON	
	R739	QRD167J-684	680K 1/6W CARBON	
	R740	QRD167J-823	82K 1/6W CARBON	
	R741	QRD167J-331	330 1/6W CARBON	
	R742	QRD167J-331	330 1/6W CARBON	
	R743	QRD167J-331	330 1/6W CARBON	
	R744	QRD167J-473	47K 1/6W CARBON	
	R745	QRD167J-103	10K 1/6W CARBON	
	R746	QRD167J-181	180 1/6W CARBON	
	R747	QRD167J-181	180 1/6W CARBON	
	R748	QRD167J-181	180 1/6W CARBON	
	R749	QRD167J-331	330 1/6W CARBON	
	R750	QRD167J-331	330 1/6W CARBON	
	R751	QRD167J-331	330 1/6W CARBON	
	R752	QRD167J-223	22K 1/6W CARBON	
	R753	QRD167J-331	330 1/6W CARBON	
	R754	QRD167J-331	330 1/6W CARBON	
	R755	QRD167J-331	330 1/6W CARBON	
	R761	QRD167J-153	15K 1/6W CARBON	
	R762	QRD167J-153	15K 1/6W CARBON	
	R763	QRD167J-223	22K 1/6W CARBON	
	R764	QRD167J-223	22K 1/6W CARBON	
	R765	QRD167J-273	27K 1/6W CARBON	
	R766	QRD167J-273	27K 1/6W CARBON	
	R767	QRD167J-472	4.7K 1/6W CARBON	
	R768	QRD167J-472	4.7K 1/6W CARBON	
	R769	QRD167J-103	10K 1/6W CARBON	
	R773	QRD167J-473	47K 1/6W CARBON	
	R783	QRD167J-680	68 1/6W CARBON	
	R784	QRD167J-680	68 1/6W CARBON	
	R785	QRD167J-562	5.6K 1/6W CARBON	
	R786	QRD167J-562	5.6K 1/6W CARBON	
	R787	QRD167J-273	27K 1/6W CARBON	
	R788	QRD167J-273	27K 1/6W CARBON	
	R789	QRD167J-103	10K 1/6W CARBON	
	R790	QRD167J-103	10K 1/6W CARBON	
	R791	QRD167J-473	47K 1/6W CARBON	
	R792	QRD167J-473	47K 1/6W CARBON	
	R821	QRD167J-683	68K 1/6W CARBON	
	R822	QRD167J-333	33K 1/6W CARBON	
	R823	QRD167J-104	100K 1/6W CARBON	
	R824	QRD167J-104	100K 1/6W CARBON	
	R825	QRD167J-470	47 1/6W CARBON	
	R826	QRD167J-333	33K 1/6W CARBON	
	R827	QRD167J-103	10K 1/6W CARBON	
	R828	QRD167J-103	10K 1/6W CARBON	
	R829	QRD167J-103	10K 1/6W CARBON	
	R831	QRD167J-222	2.2K 1/6W CARBON	
	R841	QRD167J-223	22K 1/6W CARBON	
	R842	QRD167J-183	18K 1/6W CARBON	
	R843	QRD167J-393	39K 1/6W CARBON	
	R844	QRD167J-393	39K 1/6W CARBON	
	R845	QRD167J-470	47 1/6W CARBON	
	R861	QRD167J-103	10K 1/6W CARBON	
	R862	QRD167J-333	33K 1/6W CARBON	
	R863	QRD167J-103	10K 1/6W CARBON	
	R864	QRD167J-103	10K 1/6W CARBON	
	R865	QRD167J-103	10K 1/6W CARBON	
	R866	QRD167J-103	10K 1/6W CARBON	
	R867	QRD167J-101	100 1/6W CARBON	
	R868	QRD167J-472	4.7K 1/6W CARBON	
	R869	QRD167J-221	220 1/6W CARBON	
	R871	QRD167J-223	22K 1/6W CARBON	
	R872	QRD167J-223	22K 1/6W CARBON	
	R873	QRD167J-273	27K 1/6W CARBON	
	R874	QRD167J-273	27K 1/6W CARBON	
	R875	QRD167J-470	47 1/6W CARBON	
	R891	QRD167J-331	330 1/6W CARBON	
	R892	QRD167J-331	330 1/6W CARBON	
	R893	QRD167J-103	10K 1/6W CARBON	
	R894	QRD167J-472	4.7K 1/6W CARBON	
	R895	QRD167J-472	4.7K 1/6W CARBON	
	RA271	QRB075J-103	10K 1/8W R.NETWORK	
	RA272	QRB055J-103	10K 1/8W R.NETWORK	

⚠ : SAFETY PARTS

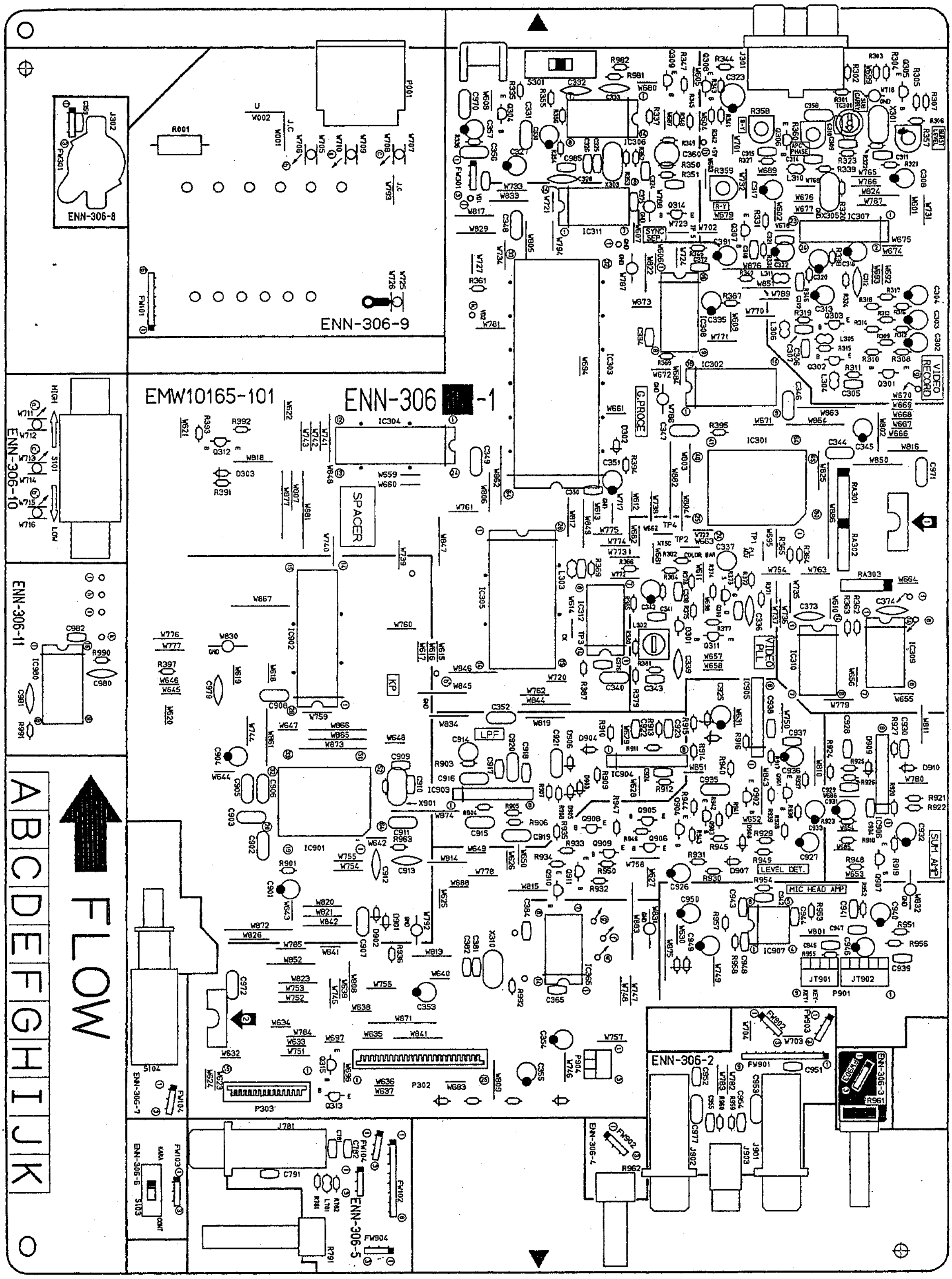
Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		EMW10163-101	CIRCUIT BOARD	
		E70225-001	EARTH PLATE	
		E70859-001	EARTH PLATE	
		E70945-H50B	HEAT SINK	
		SBSG3008Z	SCREW	
	J701	EMN00TV-217A	2P PIN JACK	
	P101	EMV7112-006	CONNECTOR(6PIN)	
	P201	EMV7123-035	CONNECTOR(35PIN)	
	P301	EMV7123-025	CONNECTOR(25PIN)	
	P501	EMV5109-010A	PLUG ASSY(10PIN)	
	P502	EMV5109-004A	PLUG ASSY(4PIN)	
	X701	ECX0169-344EA	RESONATOR	
⚠	CP101	ICP-N15	I.C. PROTECTOR	B
⚠	CP101	ICP-N15	I.C. PROTECTOR	C
	FW801	EWR37B-16KST	FLAT WIRE(7PIN)	
	FW802	EWR36B-08KST	FLAT WIRE(6PIN)	
	FW803	EWR36B-08KST	FLAT WIRE(6PIN)	
	FW804	EWR35B-08KST	FLAT WIRE(5PIN)	
	JT101	EMV7122-004	CONNECTOR(4PIN)	
	JT102	EMV7122-004	CONNECTOR(4PIN)	

⚠ : SAFETY PARTS

■ENN-306☐ Graphics PC Board Ass'y

Note : ENN-306☐ varies according to the areas employed. See note (1) when placing an order.


EMW10165-101
ENN-306▮-1
ENN-306-2
ENN-306-3
ENN-306-4
ENN-306-5
ENN-306-6
ENN-306-7
ENN-306-8
ENN-306-9
ENN-306-10
ENN-306-11
FLOW
A
B
C
D
E
F
G
H
I
J
K
SPACER
G.PROC
SYNC SEP
R-Y
B-Y
VIDEO RECORD
VIDEO PLL
LPF
KP
LEVEL DET.
MIC HEAD AMP
SUM AMP
COLOR BAR
IC301
IC302
IC303
IC304
IC305
IC306
IC307
IC308
IC309
IC310
IC311
IC312
IC901
IC902
IC903
IC904
IC905
IC906
IC907
IC980
J301
J302
J781
J901
J902
J903
P001
P302
P303
P901
JT901
JT902
S101
S103
S104
S301
X301
X310
X901
HIGH
LOW
KARA
CONT

Note(1)

PC Board Ass'y	Designated Areas
ENN-306 A	the U.S.A.
ENN-306 B	Canada
ENN-306 C	Universal Type

Transistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	Q301	2SC1740LN(R,S)	SILICON ROHM	
	Q302	2SC1740LN(R,S)	SILICON ROHM	
	Q303	2SC1740LN(R,S)	SILICON ROHM	
	Q304	2SC1740S(R,S)	SILICON ROHM	
	Q305	2SC1740LN(R,S)	SILICON ROHM	
	Q306	2SC1740LN(R,S)	SILICON ROHM	
	Q307	2SC1740LN(R,S)	SILICON ROHM	
	Q308	2SC1740LN(R,S)	SILICON ROHM	
	Q309	2SC1740LN(R,S)	SILICON ROHM	
	Q310	2SK30ATM(O)	F.E.T TOSHIBA	
	Q311	2SC1740LN(R,S)	SILICON ROHM	
	Q312	DTC114YS	SILICON ROHM	
	Q313	DTA144ES	SILICON ROHM	
	Q314	2SC1740LN(R,S)	SILICON ROHM	
	Q315	DTA144ES	SILICON ROHM	
	Q901	2SA933S(R,S)	SILICON ROHM	
	Q902	2SC1740S(R,S)	SILICON ROHM	
	Q903	2SC1740S(R,S)	SILICON ROHM	
	Q904	2SC1740S(R,S)	SILICON ROHM	
	Q905	DTA114ES	SILICON ROHM	
	Q906	DTA114YS	SILICON ROHM	
	Q907	2SC3068	SILICON SANYO	
	Q910	DTC114YS	SILICON ROHM	
	Q911	2SC1740S(R,S)	SILICON ROHM	

⚠ : SAFETY PARTS

I.C.s

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	IC301	VC4117	I.C. TOSHIBA	
	IC302	LH2464-12	I.C. SHARP	
	IC303	HD63B01Y0RAV3P	I.C.	
	IC304	LC3517BS-15	I.C. SANYO	
	IC305	VC4118	I.C. TOSHIBA	
	IC306	M52684AP	I.C. MITSUBISHI	
	IC307	BA7230LS	I.C. ROHM	
	IC308	TC74HC123AP	I.C. TOSHIBA	
	IC309	TC74HC00AP	I.C.	
	IC310	TC74HC32AP	I.C. TOSHIBA	
	IC311	TC74HC00AP	I.C.	
	IC312	TC74HC00AP	I.C.	
	IC365	TC74HC00AP	I.C.	
	IC901	YSS205-F	I.C. YAMAHA	
	IC902	HM65256BSP-10	I.C. HITACHI	
	IC903	M5218AL	I.C. MITSUBISHI	
	IC904	M5218AL	I.C. MITSUBISHI	
	IC905	M5218AL	I.C. MITSUBISHI	
	IC906	M5218AL	I.C. MITSUBISHI	
	IC907	M5209P	I.C. MITSUBISHI	
	IC980	TC74HC123AP	I.C. TOSHIBA	

⚠ : SAFETY PARTS

Diodes

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	D301	SVC321-AW	VARICAP SANYO	
	D302	1SS133	SILICON ROHM	
	D303	1SS133	SILICON ROHM	
	D901	1SS133	SILICON ROHM	
	D902	1SS133	SILICON ROHM	
	D903	1SS133	SILICON ROHM	
	D904	LTZ-MR15	L.E.D. ROHM	
	D905	1SS133	SILICON ROHM	
	D906	LTZ-MR15	L.E.D. ROHM	
	D907	1SS133	SILICON ROHM	
	D908	1SS133	SILICON ROHM	
	D909	1SS133	SILICON ROHM	
	D910	1SS133	SILICON ROHM	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C302	QETB1HM-105	1MF 50V ELECTRO	
	C303	QETB1HM-105	1MF 50V ELECTRO	
	C304	QETB1HM-105	1MF 50V ELECTRO	
	C308	QETB1HM-105	1MF 50V ELECTRO	
	C310	QCSB1HJ-680	68PF 50V CERAMIC	
	C311	QCBB1HK-820	82PF 50V CERAMIC	
	C312	QCF21HP-473	0.047MF 50V CERAMIC	
	C313	QETB1HM-105	1MF 50V ELECTRO	
	C314	QCSB1HJ-330	33PF 50V CERAMIC	
	C315	QCBB1HK-331	330PF 50V CERAMIC	
	C316	QETB1HM-105	1MF 50V ELECTRO	
	C317	QETB1HM-105	1MF 50V ELECTRO	
	C318	QCBB1HK-331	330PF 50V CERAMIC	
	C319	QCSB1HJ-330	33PF 50V CERAMIC	
	C320	QETB1HM-105	1MF 50V ELECTRO	
	C321	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C322	QETB1AM-476	47MF 10V ELECTRO	
	C323	QETB1HM-476	47MF 50V ELECTRO	
	C324	QCBB1HK-681	680PF 50V CERAMIC	
	C325	QCXB1CM-152	1500PF 16V CERAMIC	
	C326	QCSB1HJ-330	33PF 50V CERAMIC	
	C327	QETB0JM-108	1000MF 6.3V ELECTRO	
	C328	QCF21HP-473	0.047MF 50V CERAMIC	
	C330	QETB1HM-105	1MF 50V ELECTRO	
	C331	QFV81HJ-104	0.1MF 50V T.FILM	
	C332	QCF21HP-102	1000PF 50V CERAMIC	
	C333	QCF21HP-473	0.047MF 50V CERAMIC	
	C334	QCT30UJ-220	22PF 50V CERAMIC	
	C335	QETB1HM-474	0.47MF 50V ELECTRO	
	C336	QCF21HP-103	0.01MF 50V CERAMIC	
	C337	QEN51HM-474	0.47MF 50V NON POLE	
	C338	QCT30CH-180	18PF 50V CERAMIC	
	C339	QCT26CH-820	82PF 50V CERAMIC	
	C340	QCT26CH-820	82PF 50V CERAMIC	
	C341	QCT30CH-180	18PF 50V CERAMIC	
	C342	QETB1EM-106	10MF 25V ELECTRO	
	C343	QCSB1HJ-470	47PF 50V CERAMIC	
	C344	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C345	QETB0JM-227	220MF 6.3V ELECTRO	
	C346	QCZ0205-155	1.5MF 25V CERAMIC	
	C347	QCZ0205-155	1.5MF 25V CERAMIC	
	C348	QCZ0205-155	1.5MF 25V CERAMIC	
	C349	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C350	QCSB1HK-4R7	4.7PF 50V CERAMIC	
	C351	QETB1HM-474	0.47MF 50V ELECTRO	
	C352	QCZ0205-155	1.5MF 25V CERAMIC	
	C353	QETB1CM-476	47MF 16V ELECTRO	
	C354	QETB1CM-476	47MF 16V ELECTRO	
	C355	QETB1CM-476	47MF 16V ELECTRO	
	C356	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C357	QETB1CM-226	22MF 16V ELECTRO	
	C358	QCF21HP-473	0.047MF 50V CERAMIC	
	C360	QEN51HM-475	4.7MF 50V NON POLE	
	C365	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C372	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C373	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C374	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C375	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C376	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C381	QCBB1HK-101	100PF 50V CERAMIC	
	C382	QCBB1HK-101	100PF 50V CERAMIC	
	C384	QCBB1HK-101	100PF 50V CERAMIC	
	C391	QETB0JM-477	470MF 6.3V ELECTRO	
	C781	QCBB1HK-471	470PF 50V CERAMIC	
	C782	QCBB1HK-471	470PF 50V CERAMIC	
	C791	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C901	QETB1AM-107	100MF 10V ELECTRO	
	C902	QFP81HJ-332	3300PF 50V POLY	
	C903	QFP81HJ-332	3300PF 50V POLY	
	C904	QETB1AM-107	100MF 10V ELECTRO	
	C905	QFV81HJ-104	0.1MF 50V T.FILM	
	C906	QFP81HJ-332	3300PF 50V POLY	
	C907	QFV81HJ-104	0.1MF 50V T.FILM	
	C908	QFV81HJ-104	0.1MF 50V T.FILM	
	C911	QCZ0205-155	1.5MF 25V CERAMIC	
	C912	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C913	QCS21HJ-5R0	5PF 50V CERAMIC	
	C914	QFV81HJ-473	0.047MF 50V T.FILM	
	C915	QFV81HJ-103	0.01MF 50V T.FILM	
	C916	QFP81HJ-181	180PF 50V POLY	
	C917	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C918	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C919	QFN81HJ-822	8200PF 50V MYLAR	
	C920	QFP81HJ-561	560PF 50V POLY	
	C921	QFN81HJ-472	4700PF 50V MYLAR	
	C922	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C923	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C924	QCXB1CM-392	3900PF 16V CERAMIC	
	C925	QFV81HJ-393	0.039MF 50V T.FILM	
	C926	QETB1HM-225	2.2MF 50V ELECTRO	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C927	QETB1EM-106	10MF 25V ELECTRO	
	C928	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C929	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C930	QCBB1HK-121	120PF 50V CERAMIC	
	C931	QETB1EM-106	10MF 25V ELECTRO	
	C932	QETB1EM-106	10MF 25V ELECTRO	
	C933	QETB1EM-106	10MF 25V ELECTRO	
	C934	QCBB1HK-221	220PF 50V CERAMIC	
	C935	QFV81HJ-394	0.39MF 50V T.FILM	
	C936	QFV81HJ-333	0.033MF 50V T.FILM	
	C937	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C938	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C939	QCBB1HK-101	100PF 50V CERAMIC	
	C940	QFV81HJ-274	0.27MF 50V T.FILM	
	C941	QCBB1HK-221	220PF 50V CERAMIC	
	C942	QCBB1HK-471	470PF 50V CERAMIC	
	C943	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C944	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C945	QCBB1HK-101	100PF 50V CERAMIC	
	C946	QFV81HJ-274	0.27MF 50V T.FILM	
	C947	QCBB1HK-221	220PF 50V CERAMIC	
	C948	QCBB1HK-471	470PF 50V CERAMIC	
	C949	QETB1HM-474	0.47MF 50V ELECTRO	
	C950	QETB1HM-474	0.47MF 50V ELECTRO	
	C953	QCF21HP-223	0.022MF 50V CERAMIC	
	C970	QCF21HP-223	0.022MF 50V CERAMIC	
	C971	QCF21HP-473	0.047MF 50V CERAMIC	
	C972	QCF21HP-473	0.047MF 50V CERAMIC	
	C977	QCF21HP-223	0.022MF 50V CERAMIC	
	C980	QCS21HJ-821	820PF 50V CERAMIC	
	C981	QCS21HJ-221	220PF 50V CERAMIC	
	C982	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C985	QCT30CH-2R2	2.2PF 50V CERAMIC	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
⚠	R001	QRC128K-275EM	2.7M 1/2W COMPOSI	A
⚠	R001	QRC128K-275EM	2.7M 1/2W COMPOSI	B
	R301	QRD167J-750	75 1/6W CARBON	
	R302	QRD167J-680	68 1/6W CARBON	
	R303	QRD167J-821	820 1/6W CARBON	
	R304	QRD167J-821	820 1/6W CARBON	
	R305	QRD167J-103	10K 1/6W CARBON	
	R306	QRD167J-471	470 1/6W CARBON	
	R307	QRD167J-472	4.7K 1/6W CARBON	
	R308	QRD167J-222	2.2K 1/6W CARBON	
	R309	QRD167J-821	820 1/6W CARBON	
	R310	QRD167J-471	470 1/6W CARBON	
	R311	QRD167J-221	220 1/6W CARBON	
	R312	QRD167J-222	2.2K 1/6W CARBON	
	R313	QRD167J-821	820 1/6W CARBON	
	R314	QRD167J-471	470 1/6W CARBON	
	R315	QRD167J-221	220 1/6W CARBON	
	R316	QRD167J-222	2.2K 1/6W CARBON	
	R317	QRD167J-821	820 1/6W CARBON	
	R318	QRD167J-471	470 1/6W CARBON	
	R319	QRD167J-221	220 1/6W CARBON	
	R320	QRD167J-102	1K 1/6W CARBON	
	R321	QRD167J-561	560 1/6W CARBON	
	R322	QRD167J-122	1.2K 1/6W CARBON	
	R323	QRD167J-561	560 1/6W CARBON	
	R324	QRD167J-102	1K 1/6W CARBON	
	R327	QRD167J-332	3.3K 1/6W CARBON	
	R330	QRD167J-332	3.3K 1/6W CARBON	
	R331	QRD167J-102	1K 1/6W CARBON	
	R335	QRD167J-272	2.7K 1/6W CARBON	
	R336	QRD167J-822	8.2K 1/6W CARBON	
	R337	QRD167J-220	22 1/6W CARBON	A
⚠	R337	QRD14CJ-220S	22 1/4W UNF.CARBON	B
⚠	R337	QRD14CJ-220S	22 1/4W UNF.CARBON	C
	R338	QRD167J-102	1K 1/6W CARBON	
	R339	QRD167J-102	1K 1/6W CARBON	
	R340	QRD167J-101	100 1/6W CARBON	
	R341	QRD167J-750	75 1/6W CARBON	
	R342	QRD167J-183	18K 1/6W CARBON	
	R343	QRD167J-183	18K 1/6W CARBON	
	R344	QRD167J-182	1.8K 1/6W CARBON	
	R345	QRD167J-221	220 1/6W CARBON	
	R346	QRD167J-102	1K 1/6W CARBON	
	R347	QRD167J-561	560 1/6W CARBON	
	R348	QRD167J-102	1K 1/6W CARBON	
	R349	QRD167J-471	470 1/6W CARBON	
	R350	QRD167J-154	150K 1/6W CARBON	
	R351	QRD167J-471	470 1/6W CARBON	
	R352	QRD167J-103	10K 1/6W CARBON	
	R353	QRD167J-271	270 1/6W CARBON	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	R354	QRD167J-152	1.5K 1/6W CARBON	
	R355	QRD167J-222	2.2K 1/6W CARBON	
	R356	QRD167J-152	1.5K 1/6W CARBON	
	R357	QVPA601-502A	5K VARIABLE	
	R358	QVPA601-501A	500 VARIABLE	
	R359	QVPA601-501A	500 VARIABLE	
	R360	QVPA601-103A	10K VARIABLE	
	R361	QRD167J-103	10K 1/6W CARBON	
	R362	QRD167J-101	100 1/6W CARBON	
	R363	QRD167J-101	100 1/6W CARBON	
	R364	QRD167J-103	10K 1/6W CARBON	
	R365	QRD167J-101	100 1/6W CARBON	
	R366	QRD167J-103	10K 1/6W CARBON	
	R367	QRD167J-394	390K 1/6W CARBON	
	R368	QRD167J-103	10K 1/6W CARBON	
	R369	QRD167J-821	820 1/6W CARBON	
	R371	QRD167J-104	100K 1/6W CARBON	
	R372	QRD167J-472	4.7K 1/6W CARBON	
	R373	QRD167J-472	4.7K 1/6W CARBON	
	R374	QRD167J-101	100 1/6W CARBON	
	R375	QRD167J-102	1K 1/6W CARBON	
	R377	QRD167J-102	1K 1/6W CARBON	
	R378	QRD167J-104	100K 1/6W CARBON	
	R379	QRD167J-472	4.7K 1/6W CARBON	
	R380	QRD167J-471	470 1/6W CARBON	
	R381	QRD167J-471	470 1/6W CARBON	
	R382	QRD167J-471	470 1/6W CARBON	
	R384	QRD167J-103	10K 1/6W CARBON	
	R385	QRD167J-102	1K 1/6W CARBON	
	R387	QRD167J-103	10K 1/6W CARBON	
	R391	QRD167J-102	1K 1/6W CARBON	
	R392	QRD167J-472	4.7K 1/6W CARBON	
	R393	QRD167J-472	4.7K 1/6W CARBON	
	R394	QRD167J-103	10K 1/6W CARBON	
	R395	QRD167J-103	10K 1/6W CARBON	
	R397	QRD167J-102	1K 1/6W CARBON	
	R781	QRD167J-390	39 1/6W CARBON	
	R782	QRD167J-390	39 1/6W CARBON	
	R791	QVAA79B-E14B	10K VARIABLE	
	R901	QRD167J-104	100K 1/6W CARBON	
	R903	QRD167J-101	100 1/6W CARBON	
⚠	R904	QRV144F-1102A	11K 1/4W M.FILM	
⚠	R905	QRV144F-1202	12K 1/4W M.FILM	
⚠	R906	QRV144F-9101	9.1K • 1/4W M.FILM	
⚠	R907	QRV144F-1002	10K 1/4W M.FILM	
⚠	R908	QRV144F-9101	9.1K 1/4W M.FILM	
	R909	QRD167J-101	100 1/6W CARBON	
	R910	QRD167J-563	56K 1/6W CARBON	
	R911	QRD167J-154	150K 1/6W CARBON	
	R912	QRD167J-562	5.6K 1/6W CARBON	
	R913	QRD167J-333	33K 1/6W CARBON	
	R914	QRD167J-103	10K 1/6W CARBON	
	R915	QRD167J-104	100K 1/6W CARBON	
	R916	QRD167J-223	22K 1/6W CARBON	
	R917	QRD167J-104	100K 1/6W CARBON	
	R918	QRD167J-223	22K 1/6W CARBON	
	R919	QRD167J-561	560 1/6W CARBON	
	R920	QRD167J-683	68K 1/6W CARBON	
	R921	QRD167J-562	5.6K 1/6W CARBON	
	R922	QRD167J-562	5.6K 1/6W CARBON	
	R923	QRD167J-472	4.7K 1/6W CARBON	
	R924	QRD167J-273	27K 1/6W CARBON	
	R925	QRD167J-223	22K 1/6W CARBON	
	R926	QRD167J-223	22K 1/6W CARBON	
	R927	QRD167J-224	220K 1/6W CARBON	
	R928	QRD167J-273	27K 1/6W CARBON	
	R929	QRD167J-102	1K 1/6W CARBON	
	R930	QRD167J-101	100 1/6W CARBON	
	R931	QRD167J-104	100K 1/6W CARBON	
	R932	QRD167J-103	10K 1/6W CARBON	
	R933	QRD167J-103	10K 1/6W CARBON	
	R934	QRD167J-103	10K 1/6W CARBON	
	R935	QRD167J-472	4.7K 1/6W CARBON	
	R936	QRD167J-102	1K 1/6W CARBON	
	R937	QRD167J-103	10K 1/6W CARBON	
	R938	QRD167J-103	10K 1/6W CARBON	
	R939	QRD167J-103	10K 1/6W CARBON	
	R940	QRD167J-684	680K 1/6W CARBON	
	R941	QRD167J-104	100K 1/6W CARBON	
	R942	QRD167J-223	22K 1/6W CARBON	
	R943	QRD167J-103	10K 1/6W CARBON	
	R944	QRD167J-682	6.8K 1/6W CARBON	
	R945	QRD167J-392	3.9K 1/6W CARBON	
	R946	QRD167J-103	10K 1/6W CARBON	
	R947	QRD167J-154	150K 1/6W CARBON	
	R948	QRD167J-103	10K 1/6W CARBON	
	R949	QRD167J-155	1.5M 1/6W CARBON	
	R951	QRD167J-221	220 1/6W CARBON	
	R952	QRD167J-103	10K 1/6W CARBON	
	R953	QRD167J-152	1.5K 1/6W CARBON	
	R954	QRD167J-333	33K 1/6W CARBON	
	R955	QRD167J-221	220 1/6W CARBON	
	R956	QRD167J-103	10K 1/6W CARBON	
	R957	QRD167J-152	1.5K 1/6W CARBON	
	R958	QRD167J-333	33K 1/6W CARBON	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	R959	QRD167J-151	150 1/6W CARBON	
	R960	QRD167J-151	150 1/6W CARBON	
	R961	QVAA79B-E14B	10K VARIABLE	
	R962	QVAA79B-E14B	10K VARIABLE	
	R963	QRD167J-101	100 1/6W CARBON	
	R990	QRD167J-105	1M 1/6W CARBON	
	R991	QRD167J-105	1M 1/6W CARBON	
	R992	QRD167J-105	1M 1/6W CARBON	
	RA301	ERB04XJ-102	1K 4W R.NETWORK	
	RA302	ERB04XJ-102	1K 4W R.NETWORK	
	RA303	ERB04XJ-102	1K 4W R.NETWORK	

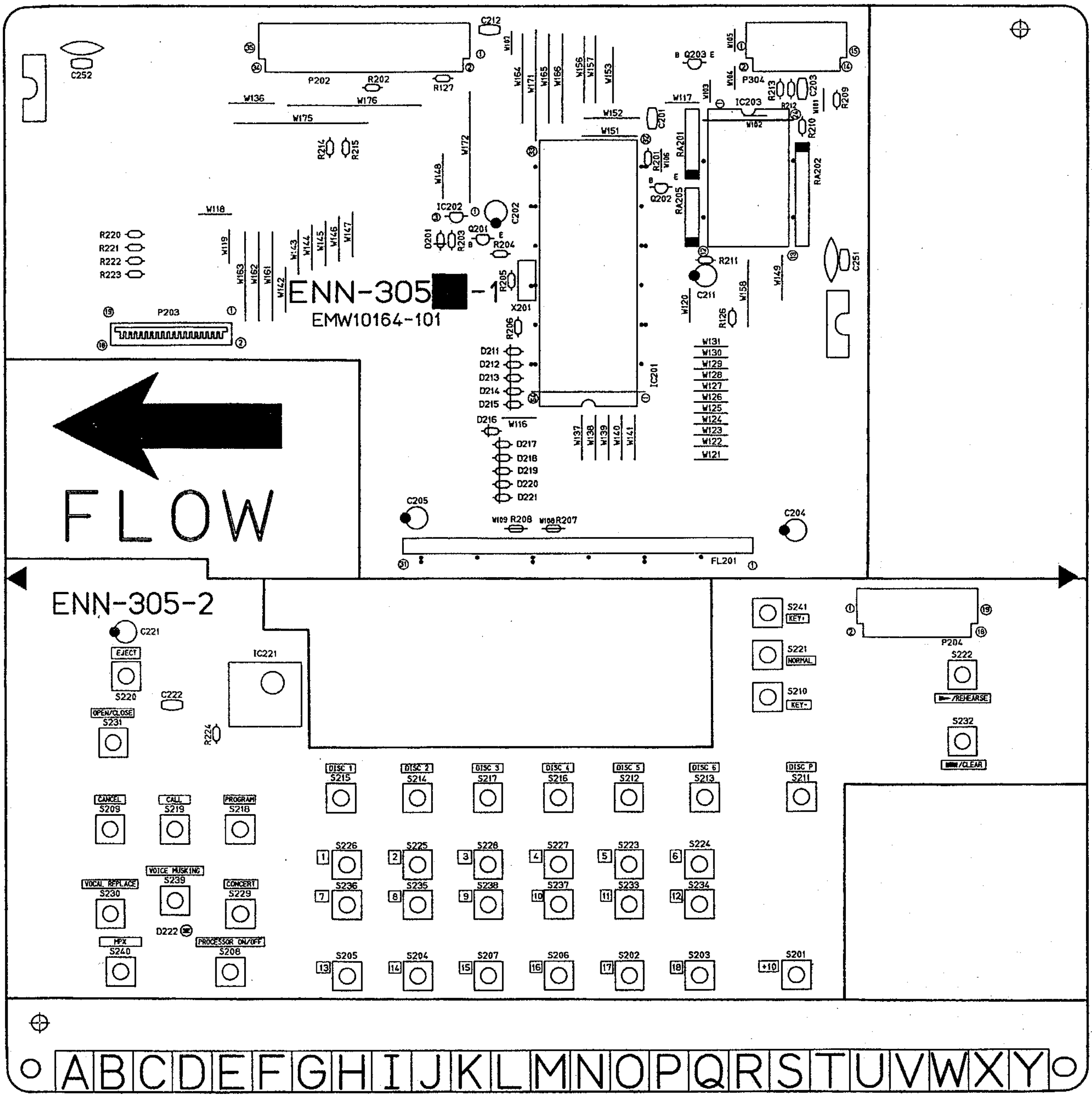
⚠ : SAFETY PARTS

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		EMW10165-101	CIRCUIT BOARD	
		E307473-001	JACK HOLDER	
		E70225-001	EARTH PLATE	
		E70859-001	EARTH PLATE	
		E75464-001	EARTH PLATE	
		EWT011-063	TERMINAL WIRE	A
		EWT011-063	TERMINAL WIRE	B
	J301	EMN00YV-211A	2P PIN JACK	
	J302	QMCK001-E01E	DIN SOCKET	
	J781	QMS6A20-E21H	HEADPHONE JACK	
	J901	QMS6A20-EA1H	MICROPHONE JACK	
	J902	QMS6A20-EA1H	MICROPHONE JACK	
	J903	QMS3L30-E20S	MINI JACK	
	L302	EQR3202-001	TV OSC COIL	
	L303	EQL4004-1R0	INDUCTOR	
	L310	EQL4004-101	INDUCTOR	
	L311	EQL4004-101	INDUCTOR	
	L781	EQL4004-1R0	INDUCTOR	
	P001	QMCB001-E03H	AC INLET	A
	P001	QMCB001-E03H	AC INLET	B
	P001	QMCB001-E02H	AC SOCKET	C
	P302	EMV7123-025	CONNECTOR(25PIN)	
	P303	EMV7123-015	CONNECTOR(15PIN)	
	P904	EMV7122-103	CONNECTOR(3PIN)	
	S101	QSS1L22-E01	SLIDE SWITCH	C
	S103	QSS1A12-E01	SLIDE SWITCH	
	S104	QST4101-E19	PUSH SWITCH	
	S301	QSS1F22-E01	SLIDE SWITCH	
	X301	ECX3579-545CP	RESONATOR	
	X303	ECX0000-500KR	RESONATOR	
	X305	ENZ5006-001	FILTER	
	X310	ECX0000-500KS	RESONATOR	
	FW101	EWR36B-10KST	FLAT WIRE(6PIN)	
	FW102	EWR38B-40LST	FLAT WIRE(8PIN)	
	FW103	EWR33B-13SST	FLAT WIRE(3PIN)	
	FW104	EWR33B-13SST	FLAT WIRE(3PIN)	
	FW301	EWR33B-25SST	FLAT WIRE(4PIN)	
	FW901	EWR39B-16LST	FLAT WIRE(9PIN)	
	FW902	EWR33B-10SST	FLAT WIRE(3PIN)	
	FW903	EWR33E-08SST	FLAT WIRE(3PIN)	
	FW904	EWR33B-45LST	FLAT WIRE(3PIN)	
	JT901	EMV7122-004	CONNECTOR(4PIN)	
	JT902	EMV7122-005	CONNECTOR(5PIN)	
	TC301	ENZ1003-015	TRIMMER	

⚠ : SAFETY PARTS

■ENN-305 A FL & Micro-computer PC Board Ass'y


ENN-305■-1
EMW10164-101
FLOW
ENN-305-2
P202
P203
P204
P304
IC201
IC202
IC203
IC221
X201
FL201
C201
C202
C203
C204
C205
C211
C212
C221
C222
C251
C252
Q201
Q202
Q203
RA201
RA202
RA205
D201
D211
D212
D213
D214
D215
D216
D217
D218
D219
D220
D221
D222
EJECT
S220
OPEN/CLOSE
S231
CANCEL
S209
CALL
S219
PROGRAM
S218
VOCAL REPLACE
S230
VOICE MASKING
S239
CONCERT
S229
MPX
S240
PROCESSOR ON/OFF
S208
DISC 1
S215
DISC 2
S214
DISC 3
S217
DISC 4
S216
DISC 5
S212
DISC 6
S213
DISC P
S211
KEY↑
S241
NORMAL
S221
KEY-
S210
▶/REHEARSE
S222
■/CLEAR
S232
+10
S201
A B C D E F G H I J K L M N O P Q R S T U V W X Y

Transistors

⚠	ITEM	PART NUMBER	DESCRIPTION		AREA
	Q201	DTC114YS	SILICON	ROHM	
	Q202	DTA144WS	SILICON	ROHM	
	Q203	DTA114YS	SILICON	ROHM	

⚠ SAFETY PARTS

I.C.s

⚠	ITEM	PART NUMBER	DESCRIPTION		AREA
	IC201	HD404729B49S	I.C.	HITACHI	
	IC202	MN1281(P,Q)	I.C.	MATSUSHITA	
	IC203	MB88304P	I.C.	FUJITSU	
	IC221	GP1U561	I.C.	SHARP	

⚠ SAFETY PARTS

Diodes

⚠	ITEM	PART NUMBER	DESCRIPTION		AREA
	D201	1SS133	SILICON	ROHM	
	D211	1SS119	SILICON	HITACHI	
	D212	1SS119	SILICON	HITACHI	
	D213	1SS119	SILICON	HITACHI	
	D214	1SS119	SILICON	HITACHI	
	D215	1SS119	SILICON	HITACHI	
	D216	1SS119	SILICON	HITACHI	
	D217	1SS119	SILICON	HITACHI	
	D218	1SS119	SILICON	HITACHI	
	D219	1SS119	SILICON	HITACHI	
	D220	1SS119	SILICON	HITACHI	
	D221	1SS119	SILICON	HITACHI	
	D222	SLR-34VC3F	L.E.D.	ROHM	

⚠ SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C201	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C202	QETB1AM-107	100MF 10V ELECTRO	
	C203	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C204	QETB1HM-475	4.7MF 50V ELECTRO	
	C205	QETB1HM-475	4.7MF 50V ELECTRO	
	C211	QETB1HM-476	47MF 50V ELECTRO	
	C212	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C221	QER50JM-476	47MF 6.3V ELECTRO	
	C222	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C251	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C252	QCHB1EZ-223	0.022MF 25V CERAMIC	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	R126	QRD167J-152	1.5K 1/6W CARBON	
	R127	QRD167J-152	1.5K 1/6W CARBON	
	R201	QRD167J-223	22K 1/6W CARBON	
	R202	QRD167J-102	1K 1/6W CARBON	
	R203	QRD167J-821	820 1/6W CARBON	
	R204	QRD167J-103	10K 1/6W CARBON	
	R205	QRD167J-105	1M 1/6W CARBON	
	R206	QRD167J-472	4.7K 1/6W CARBON	
	R209	QRD167J-102	1K 1/6W CARBON	
	R210	QRD167J-472	4.7K 1/6W CARBON	
	R211	QRD167J-104	100K 1/6W CARBON	
	R212	QRD167J-103	10K 1/6W CARBON	
	R213	QRD167J-103	10K 1/6W CARBON	
	R214	QRD167J-103	10K 1/6W CARBON	
	R215	QRD167J-103	10K 1/6W CARBON	
	R220	QRD167J-473	47K 1/6W CARBON	
	R221	QRD167J-473	47K 1/6W CARBON	
	R222	QRD167J-473	47K 1/6W CARBON	
	R223	QRD167J-473	47K 1/6W CARBON	
	R224	QRD167J-331	330 1/6W CARBON	
	RA201	QRB055J-472	4.7K 1/8W R.NETWORK	
	RA202	QRB085J-472	4.7K 1/8W R.NETWORK	
	RA205	QRB045J-103	10K 1/8W R.NETWORK	

⚠ : SAFETY PARTS

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		EMW10164-101	CIRCUIT BOARD	
		E3400-376	FELT SPACER	
		E70859-001	EARTH PLATE	
		E74482-001	BRACKET	
	P202	EMV7123-035R	CONNECTOR(35PIN)	
	P203	EMV7123-019	CONNECTOR(19PIN)	
	P204	EMV7123-019R	CONNECTOR(19PIN)	
	P304	EMV7123-015R	CONNECTOR(15PIN)	
	S201	ESP0001-018	TACT SWITCH(+10)	
	S202	ESP0001-018	TACT SWITCH(17)	
	S203	ESP0001-018	TACT SWITCH(18)	
	S204	ESP0001-018	TACT SWITCH(14)	
	S205	ESP0001-018	TACT SWITCH(13)	
	S206	ESP0001-018	TACT SWITCH(16)	
	S207	ESP0001-018	TACT SWITCH(15)	
	S208	ESP0001-018	TACT SWITCH(PROS ON/OFF)	
	S209	ESP0001-018	TACT SWITCH(CANCEL)	
	S210	ESP0001-018	TACT SWITCH(KEY −)	
	S211	ESP0001-018	TACT SWITCH(DISC P)	
	S212	ESP0001-018	TACT SWITCH(DISC 5)	
	S213	ESP0001-018	TACT SWITCH(DISC 6)	
	S214	ESP0001-018	TACT SWITCH(DISC 2)	
	S215	ESP0001-018	TACT SWITCH(DISC 1)	
	S216	ESP0001-018	TACT SWITCH(DISC 4)	
	S217	ESP0001-018	TACT SWITCH(DISC 3)	
	S218	ESP0001-018	TACT SWITCH(PROGRAM)	
	S219	ESP0001-018	TACT SWITCH(CALL)	
	S220	ESP0001-018	TACT SWITCH(EJECT)	
	S221	ESP0001-018	TACT SWITCH(NORMAL)	
	S222	ESP0001-018	TACT SWITCH(PLAY/REHEARSE)	
	S223	ESP0001-018	TACT SWITCH(5)	
	S224	ESP0001-018	TACT SWITCH(6)	
	S225	ESP0001-018	TACT SWITCH(2)	
	S226	ESP0001-018	TACT SWITCH(1)	
	S227	ESP0001-018	TACT SWITCH(4)	
	S228	ESP0001-018	TACT SWITCH(3)	
	S229	ESP0001-018	TACT SWITCH(CONCERT)	
	S230	ESP0001-018	TACT SWITCH(V.REP)	
	S231	ESP0001-018	TACT SWITCH(OPEN/CLOSE)	
	S232	ESP0001-018	TACT SWITCH(STOP/CLEAR)	

⚠ : SAFETY PARTS

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	S233	ESP0001-018	TACT SWITCH(11)	
	S234	ESP0001-018	TACT SWITCH(12)	
	S235	ESP0001-018	TACT SWITCH(8)	
	S236	ESP0001-018	TACT SWITCH(7)	
	S237	ESP0001-018	TACT SWITCH(10)	
	S238	ESP0001-018	TACT SWITCH(9)	
	S239	ESP0001-018	TACT SWITCH(V.MUSK)	
	S240	ESP0001-018	TACT SWITCH(DUAL AUDIO)	
	S241	ESP0001-018	TACT SWITCH(KEY +)	
	X201	ECX0004-194KM	RESONATOR	
	FL201	ELU0001-129	FL TUBE	

⚠ : SAFETY PARTS

Accessories List

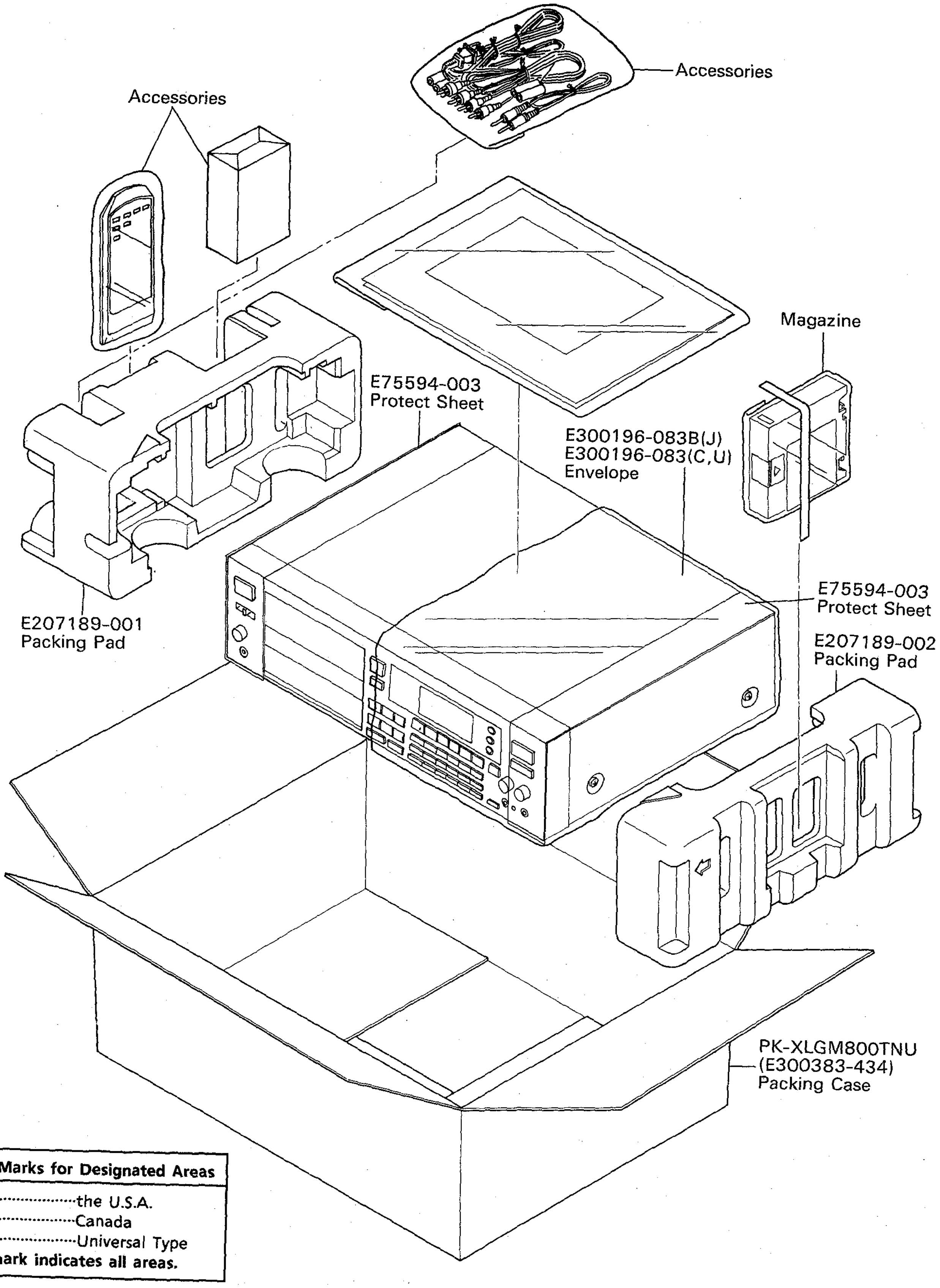
⚠	Part Number	Part Name	Q'ty	Description	Areas
	E30580-1782A	Instruction Book	1		
	BT-20047F	Warranty Card	1		J
	BT-20025K	Warranty Card	1		C
	BT-20044G	Safety Instruction Sheet	1		J
	BT-20108A	Service Information Card	1		J
	BT20071A	Service Center List	1		C
	ENZ1010-001	RF-Unit	1		J
⚠	QMP1E00-183	Power Cord	1		J,C
⚠	QMP7530-183	Power Cord	1		U
	EWP302-013K	Signal Cord	1		
	EWP304-011	Video Signal Cord	1		
	E35497-022	Caution Sheet	1	220V	U
⚠	E04056	Siemens Plug	1		U
	E26072-005	Magazine	1		
	RM-SX800U	Remote Controller	1		
	RM-SX521BATC	Battery Cover	1		
	UM-4NJ-2PSA	Battery	1		
	E66416-003	Envelope	1		J
	E300196-010B	Envelope	1	for instruction Book	J
	E300196-010	Envelope	1	for instruction Book	C,U
	E300196-032B	Envelope	1		J
	E300196-032	Envelope	1		C,U

The Marks for Designated Areas

⚠ Safety Parts

J······················the U.S.A.
C······················Canada
U······················Universal Type
No mark indicates all areas.

Packing Materials and Part Numbers


Accessories
Accessories
Magazine
E75594-003
Protect Sheet
E300196-083B(J)
E300196-083(C,U)
Envelope
E207189-001
Packing Pad
E75594-003
Protect Sheet
E207189-002
Packing Pad
PK-XLGM800TNU
(E300383-434)
Packing Case

The Marks for Designated Areas

J··························the U.S.A.
C··························Canada
U··························Universal Type
No mark indicates all areas.